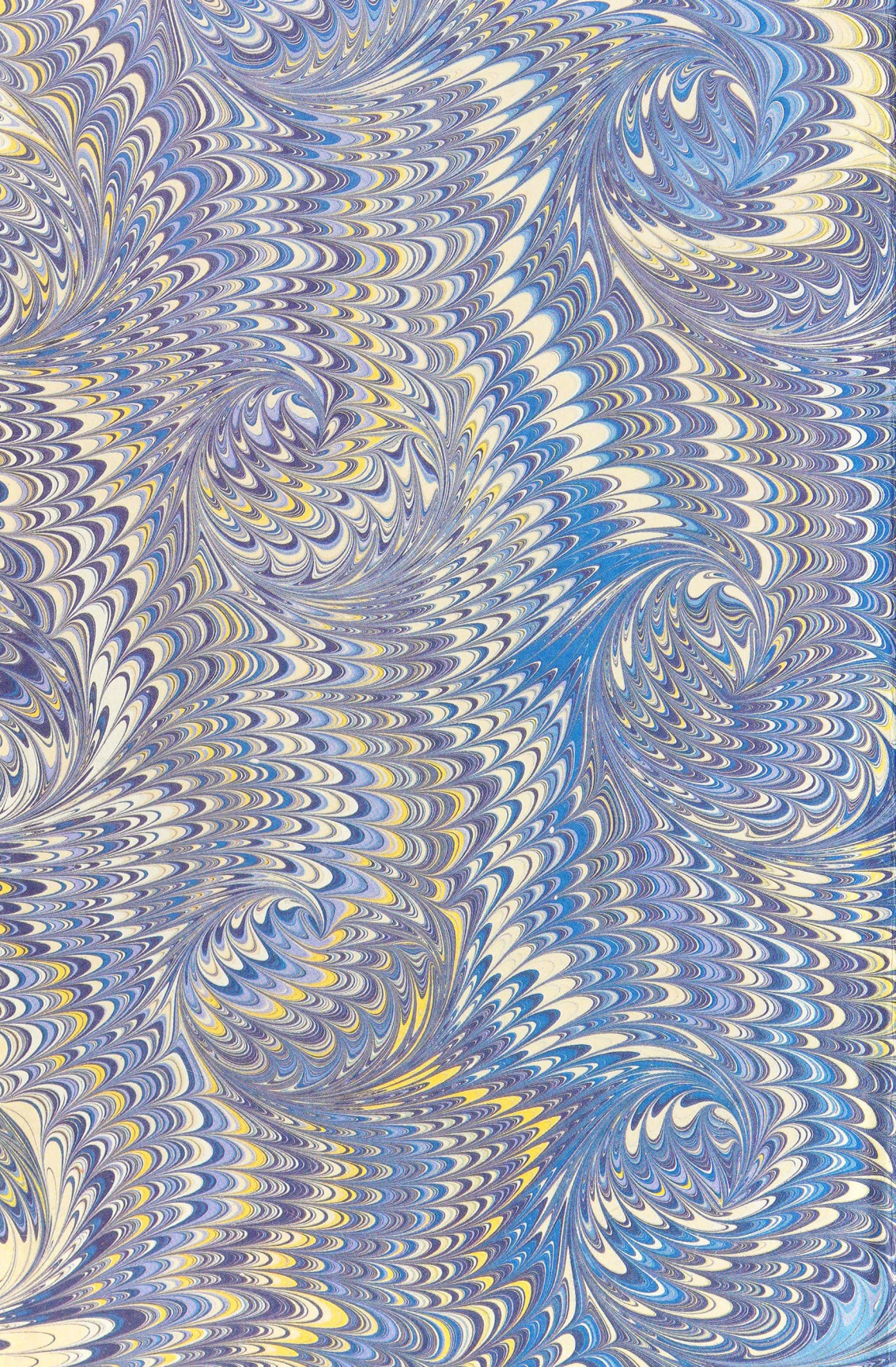
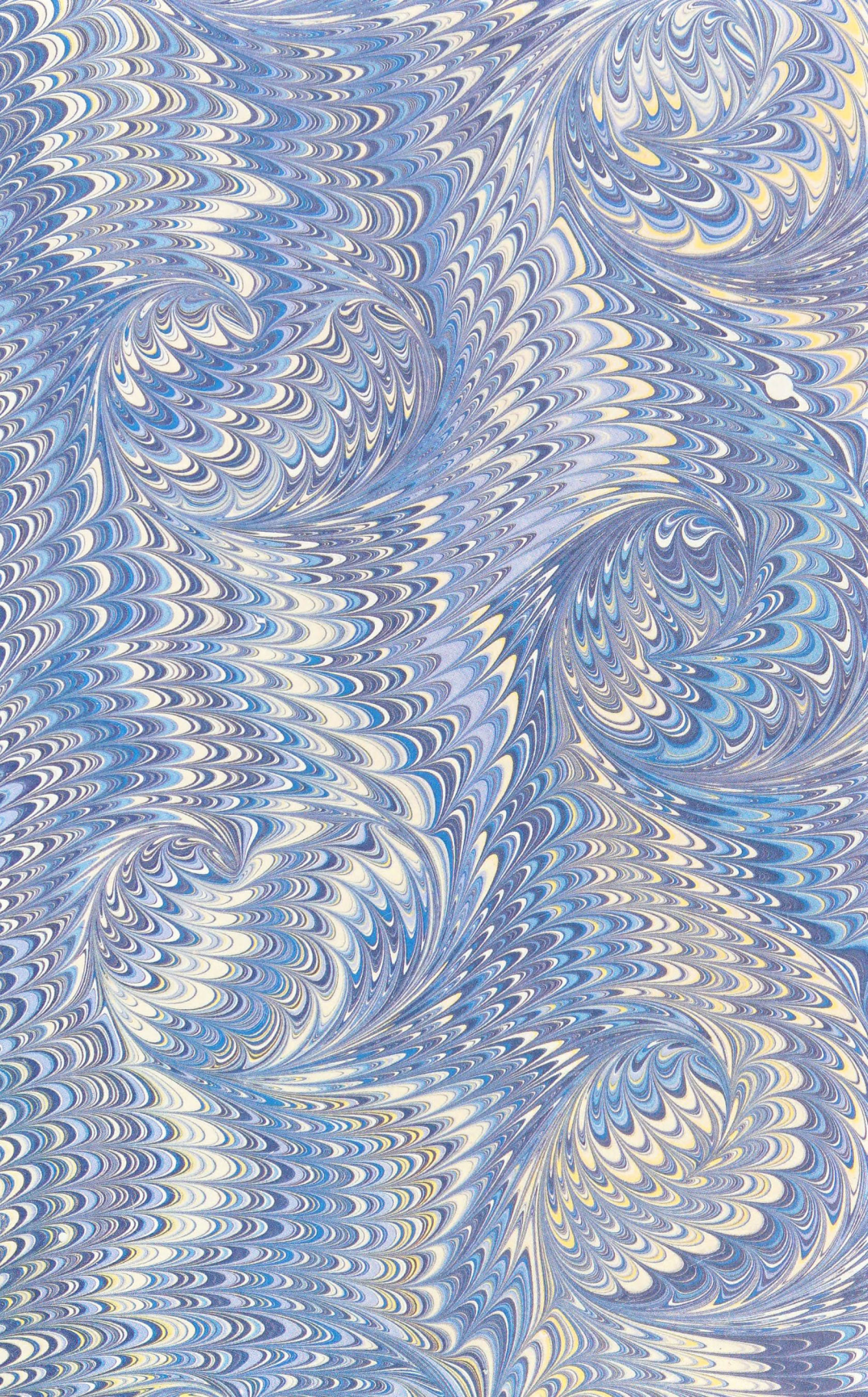
BOEING B-47 STRATOJET

True Stories
of the Cold War in the Air

Edited by Mark Natola
Introduction by Robert M. Robbins

A SCHIFFER MILITARY HISTORY BOOK





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Schiffer Military History
Atglen, PA

Dedication

This book is dedicated to the tens of thousands of people whose association with the B-47 program contributed so much to its outstanding successes. Those people include creators, designers, builders and testers and especially the men and women in the United States Air Force Strategic Air Command who employed the B-47 so effectively and their families who supported them. Some paid with their lives and left families who had to put shattered lives back together after such losses. All made sacrifices – particularly those in the Strategic Air Command, which was notorious for being demanding, tough and unforgiving. They all deserve the appreciation of a grateful nation for their dedication, contributions and sacrifices. Some of those people have written the stories that make this book. The B-47 program's successes include helping avoid a threatened World War III during the 1950s and 1960s and providing the technological base for the subsequent explosive development of jet transportation and the fantastic advances resulting therefrom.

Robert M. Robbins, Boeing Experimental Test Pilot, XB-47
Mark A. Natola, Historian B-47 Stratojet Association, Creator and Editor of "B-47 True Stories"

Book design by Robert Biondi.

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Contents

Introduction, Robert M. Robbins 7

The XB-47 First Flight, Robert M. Robbins 17
Longitudinal Stability With Flexible Wings – A Fatal Defect!!, William Cook 28
The K. B. Wolfe Story, General Guy M. Townsend 30
Flight Testing the XB-47, James A. Fraser 31
The XB-47's Record Setting Flight in February 1949, Colonel Russ Schleeh, ... 34
The First 39 Engine B-47 Takeoff, Curtis E. McNay 36
The Boeing XB-47D Turboprop, Raymond L. McPherson 38
B-47 Ejection Seat Tests, Lew Wallick 42
B-47 Downward Seat Ejection Tests, Colonel Jesse Jacobs 43
Flying the B-47, Lt. Colonel Edwin C. Ross 44
Man in the Burning Bomber, John Hubbell 60
B-47 Vignettes, Colonel Walter J. Boyne 64
A Matter of Survival, Lt. Colonel Edward W. Jedrziewski, ... 66
ALERT, Lt. Colonel Edward W. Jedrziewski 71
B-47 and F-86 Mid-Air Collision, Colonel Howard Richardson 77
Cold Humor During the Cold War, Major John P. Noonan 80
Runaway RB-47 (Unmanned), Major John P. Noonan 82
Cold War Over-flight of the Soviet Union, Colonel Harold R. Austin 85
Comments from the Back Seat, Captain Carl Holt 89
Overflight – Strategic Reconnaissance of the Soviet Union, Colonel Donald E. Hillman 90
B-47 Flight From Guam to Sidi Slimane, Morocco, Lt. General James V. Edmundson 97
Operation Redwing #1, Lt. Colonel Robert H. Ottman 98
Operation Redwing #2, Colonel Thomas M. Sumner 104
Flying on Fumes, Lt. Colonel Alex P. Brewer 109
How I Learned to Love Navigators, Colonel Richard H. Wood 119
I'm the Navigator And I Had Nothing To Do With That landing!,
Lt. Colonel Alex P. Brewer 122
The B-47 in the 1955 National Air Race, Lt. Colonel Joseph D. Brown 126
The B-47 in the 1956 National Air Race, Lt. Colonel Christian J. Luecke 128
B-47 Low Level & LABS Tactic, Lt. Colonel Barnett B. Young 131

LABS Maneuvers, Lt. Colonel Robert M. Winn 133
The Day South Carolina Was A-Bombed, SM/Sgt Norm Viehweg 134
A Comedy of Errors, Lt. Colonel Allen C. Hart 137
An Unusual B-47 Activity, Major General James P. Smothermon 140
Bail out! Bail out!, Captain Joseph M. Harter 141
Everglades Bail out, Lt. Colonel Maury E. Saunders 144
Aluminum Cloud, Lt. Colonel Hank Cervantes 146
B-47 High Flight, Colonel Dick Weidman 146
Could You Buy a Ride in a B-47 for $50?, Captain Neil A. Ludvigson 155
Crew Chief, Sgt. Robert Covington 157
Dead Men Flying, Colonel Louis Wagner 159
How Our B-47 Came Through In A Moment Of Need, Lt. Colonel Frank Knaack 160
A Few of My B-47 Stories, Lt. Colonel Sidney F. Wattinger 162
Quothe the Raven: Nevermore, Lt. Colonel Robert B. Wiley 164
The B-47E Phase V, Captain Ronald Camp 165
Test flight in B-47E #53-2280, CMSgt. Ernest L. Suggs 171
The City of Salina, Lt. Colonel Paul R. Houser 175
The WB-47E Arc Light Mission Loon 99, Colonel Charles N. D. Smith 177
Radio Silent, Lt. Colonel Bruce Bailey 179
Why Don't You Fix the Bloody Thing?, Lt. Colonel Bruce Bailey 181
Seventh Man, Lt. Colonel Bruce Bailey 182
Recollections of a B-47 Pilot, Colonel Leslie E. Gaskins 183
Lonesome George, Major John P. Noonan 192
COCO Alert, Lt. Colonel Joseph M. Pilcher 194
Heads Up Flying Club, Colonel Ron P. Berniscone 196
Hot Wiring a B-47, Lt. C.O. Smith 197
Routine?, Captain Neil A. Ludvigson 199
Three Today in Tampa Bay, Colonel William W. Simmons 202
The Straight Poop, Lt. Colonel Hal K. Bowman 205
Final Flight of RB-47 #43290; A Crow's Reflections, Major George V. Back 208
Final Flight of An Operational B-47, Colonel Richard L. Purdum 211
The Last Active Flight, Lt. Colonel Raymond Hamilton 213
The Final Flight of the Last Operational B-47, Lt. Colonel Dave L. Hall 214
One More Time, Walter House 215
Spirit, The Last Flight of a B-47, Major General J.D. Moore 217

Glossary 220

Introduction

B-47 True Stories is a remarkable collection of true, mostly never-before-told, first person stories about some incredible experiences with the radical B-47 airplane, its fascinating roles in perhaps preventing a much-feared World War III and in launching the world into the modern jet transport age.

B-47 True Stories is a tribute to the thousands of people in industry and in the Air Force who made the program such an outstanding success. This applies especially to those in the Strategic Air Command and their families who often sacrificed a very great deal to make the B-47 program the awesome powerhouse that it was. This comes into even sharper focus when one "reads" the unspoken words between the lines in many of the stories. We honor and salute those dedicated people.

Fifty-six authors with intimate connections to the B-47 have written sixty-three individual stories. The authors range from amateurs to professionals; from the experimental test pilots who flew the first flights, to airmen who maintained the airplanes, to combat crewmen who flew the sometimes-dangerous reconnaissance and airborne alert missions, to Air Force Generals who commanded large segments of the huge 2040 airplane B-47 fleet. The authors include engineers who helped design and improve the XB-47 and the many B-47 variants that followed.

The more than 1000 members of the B-47 Stratojet Association and others were invited to submit stories. As this book is being printed, excellent stories are still being received which may be published in future volumes. Additional stories will be most welcome and enthusiastically received. All will be preserved for future historians.

The stories in this book range from "by the book" to "by the seat of the pants," from tragic and heart wrenching to hilarious, and from deadly serious to lighthearted. Some have sad and others have happy endings. Some are scary – like being blinded and hit by the flash and shock wave of an exploding nuclear bomb. They are informative, educational, enjoyable, historical – and true. General Curtis LeMay once wrote: "In my opinion, first person accounts ... are historically more reliable than most historians' accounts." These stories are such first person accounts. At the same time the reader will realize that 40 or more years have passed and memory of some details may be clouded.

The authors were totally free to select and write about their experiences as they wished. Accordingly, the stories are "snapshots" of B-47 events, which are varied and random with no preplanned overall outline or theme. Although the stories have been grouped into related categories in an attempt to provide some continuity, the real common denominator is the many-faceted B-47 program itself and the many superb people associated with it.

Many of the stories presume a familiarity with various aspects of the B-47 airplane and program, which some readers may not be aware of. Accordingly, it seems appropriate to briefly summarize important aspects of both the airplane and the program. With that perspective, the significance of many of the stories will be substantially enhanced.

The B-47 program really began in 1943 when the United States Army Air Force invited five contractors to study the feasibility of multi-engine jet bombers. At the time there was little hope for a truly useful jet bomber because of expected range problems. But the Air Force wanted to give it a try. Ultimately, in 1947, five experimental jet bombers did fly: The XB-45, XB-46, XB-47, XB-48 and YB-49. They all had range and other problems. Only the XB-45, which flew first, and the XB-47, which flew last, were put into production. 142 B-45 and 2042 B-47 types were built.

Except for the four jet engines, the North American XB-45 was pretty much a conventional airplane. In contrast, the Boeing XB-47 was a radical six-engine swept wing airplane that almost didn't happen because Boeing engineers had so much trouble developing a configuration that they considered viable. Also in contrast to North American, Boeing was not much interested in building a jet bomber based largely on conventional technology with the shortcomings that would result. Consequently, Boeing spent a lot of time trying and trying again to find a configuration that they could be satisfied with while their competitors charged ahead with mediocre designs.

Boeing had three crucial things going for it:

- It had an engineering/management philosophy that wanted any new design to fully incorporate advantageous, innovative, leading-edge technology. They wanted it to be superior and a big step forward. They also wanted that basic design to have as much growth potential as feasible in order to take full advantage of future improvements that almost always are derived from flight test, operational experience and state-of-the-art developments.

- Boeing had superbly creative, competent and far-seeing engineering talent.

- Boeing had recently built and owned its own very powerful high-speed wind tunnel located close to its engineering and management offices. They could and usually did run it almost every night for months with new B-47 model configurations from their model shop almost every evening based on an analysis of the previous night's run. The XB-47 was the first airplane to benefit fully from this new, vital facility. No other company was close to having that capability.

It took Boeing a long time to develop a configuration that satisfied it and the Air Force. For a while it appeared hopeless and some people thought the effort should be abandoned. By the time an acceptable preliminary design was established, the competition (B-45) was already proceeding with production and using money that Boeing would like to have the Air Force spend on B-47 production instead. The self-imposed pressure was now on Boeing to complete detailed design of a test airplane (the XB-47) and get it flying as soon as possible hoping that its superiority would convince the Air Force to buy it and cut short B-45 production.

The major challenge for Boeing had centered on the characteristics of the jet engine. It was efficient only when operating at very high airspeeds. It also had to be at high altitude so that the airplane drag would be low in the rarefied air at altitude. Those high airspeeds at high altitude were severely limited on conventional airplanes by Mach drag rise: the rapid increase in drag that occurs as the airplane's airspeed approaches the speed of sound (Mach 1). This "critical Mach number" (rapid drag rise) occurred on conventional airplanes at a relatively low airspeed. Consequently, jet engine efficiency was poor and airplane range was poor. Making the conventional straight wing thinner raised the critical Mach number some but not enough. The swept wing was ultimately to be the long sought after answer.

Theoretical analyses on swept wings in 1935 in Germany and in early 1945 by Robert Jones at the National Advisory Committee for Aeronautics in the United States were essentially unrecognized. In May 1945 Boeing's George Schairer was a member of a U.S. Scientific Advisory Group in Germany investigating German World War II aviation developments. He found German research and wind tunnel data showing that wing sweep did in fact significantly raise the critical Mach number on a wing. On May 10, 1945 George Schairer wrote from Germany to his assistant, Ben Cohn, in Seattle briefly describing the German research results. He also instructed Ben to immediately send copies of his letter to the aerodynamic leaders in six other U.S. companies since his findings really belonged to the U.S. government. Boeing on the XB-47 and North American on the XF-86 were the

only two that reacted aggressively to the information. Boeing wind tunnel tests quickly confirmed that 35 degrees of wing sweep with a thin wing was what the XB-47 needed. That thin wing was also very flexible – 17 1/2-foot deflection measured at the wing tips was possible – and fascinating to watch in rough air!

The next major problem was engine placement. Many locations were tried over months of wind tunnel testing until the now familiar strut mounted arrangement evolved. Boeing's Chief Engineer, Ed Wells has been credited with initiating that idea.

The third major problem was where to put the landing gear. The wings were too thin and retracting a tricycle gear into the body led to major disadvantages. The bicycle landing gear was an Air Force suggestion from Col. Pete Warden based on an experimental installation the Air Force had the Martin Company put on a B-26 named the "Middle River Stump Jumper." It was an excellent choice for the XB-47 but did have some operational disadvantages as the B-26's name implies.

With those three major problems solved, the XB-47 design was "on a roll" and Boeing would now try to play catch up with the competition. Even so, it was commonly recognized that if the XB-47 was placed in production there would be many problems still needing solution in the years ahead. However, no one realized how many or how big some of those problems would be as the B-47s would be pushed by the Air Force over time to do more and more as its great growth potential unfolded.

Many problems were recognized early as the XB-47 design and construction progressed – well before the first flight on December 17, 1947. Methods for coping with the known and with possible unknown problems were developed as part of the planning and preparation for the first flight.

Initial XB-47 flight-testing was conducted at Moses Lake AFB in eastern Washington State. The Phase I flight test program was flown by Boeing between 17 December 1947 and 21 July 1948. It consisted of forty-seven flights in forty-three hours on the two XB-47s. Air Force Major Guy M. Townsend flew the Air Force Phase II flight test program on the #1 XB-47 between 8 July and 15 August 1948. It consisted of thirty flights in thirty-eight hours. Results from both programs were considerably better than had been hoped for in spite of identified problems.

On the morning of 19 July 1948, high level Air Force Brass visiting Seattle on B-50 and B-54 business had virtually no interest in the XB-47. Even though they would be essentially flying over Moses Lake that afternoon in their B-17 on their return to Dayton, they were so disinterested in the XB-47 that they were unwilling to spend even a few extra minutes stopping at Moses Lake to see it. Boeing President, Bill Allen, was finally able to convince them to just stop briefly. Once there,

Col. Pete Warden was able to convince Maj. Gen. K.B. Wolfe to allow Maj. Townsend to take him on a twenty-six-minute demonstration flight in the XB-47. It was immediately followed by a spectacular four-minute flight using 18 JATO rockets to almost double the jet engine's normal thrust for twelve seconds during takeoff. Gen. Joe McNarney, Maj. Gen. K.B. Wolfe, Col. Pete Warden, Bill Allen and others witnessed that impressive takeoff. (story on page 30) So impressed was Maj. Gen. Wolfe that within ten days Boeing had an informal order for ten B-47As to jump start production. On 31 July Col. Albert Boyd, Chief of Flight Test at Wright Field, flew the XB-47 with Maj. Townsend. Less than a month after Maj. Townsend completed the Air Force Phase II Flight Test evaluation on 15 August, the B-47B production program was underway. B-47A production deliveries started in December 1950 followed by the first B-47B delivery to SAC in October 1951.

A total of 2042 B-47 type aircraft would be delivered by the time production ended in February 1957 – some six years after the first B-47A delivery. In addition to the two XB-47s, there would be six major production configurations as follows:

10	**B-47As**	1341	**B-47Es**	35	**RB-47Hs**
399	**B-47Bs**	240	**RB-47Es**	15	**RB-47Ks**

There would be twenty-five major B-47 bases in the United States and seventeen overseas bases from which twenty-eight B-47 Bomb Wings and five Reconnaissance Wings would operate with some 1900 B-47 type airplanes.

In addition to the above six major production configurations, there were some thirty additional B-47 model designations. All were based on modifying production airplanes. A few, such as TB-47s, YRB-47s and WB-47s were used in significant numbers. Others were one-of-a-kind flight test platforms for such items as engines, missiles and possible improvements such as spoilers and cross wind landing gear which were never put on production B-47s but were on B-47 descendants such as the B-52.

Although substantial engineering and wind tunnel work was done, a few promising improvements never reached the flight test stage. Notable among these was the B-47C four-engine configuration, which could have included a new, thicker, even more efficient wing, which ultimately had been developed in the Boeing wind tunnel – but too late to meet early B-47 production requirements. That wing development was incorporated on the B-52. There is strong evidence that General LeMay was adamantly opposed to improving the B-47 too much by such means. He was afraid it might kill funding for B-52 production, which he strongly supported. History has validated his strong B-52 support.

To develop all these configurations required a great amount of engineering and wind tunnel effort and flight-testing in addition to the extensive effort expended to try to eliminate shortcomings and "grow" the B-47. Engineering and experimental flight-testing by Boeing, the Air Force and other contractors extended over almost the whole life of the B-47 program.

Some of the shortcomings of the B-47 were recognized before the XB-47 ever flew. These included very long and inconsistent engine acceleration times from low power settings (fifteen or more seconds from idle); severe rolling due to yaw could be caused by an engine failure on takeoff or by unsymmetrical engine acceleration during an aborted landing or go-around; a very low drag (clean) airplane even in the landing configuration and positive engine thrust even at idle power (no windmilling propeller drag) which combined to give very flat landing approaches especially when additional power was used on the approach to reduce engine acceleration times; high landing speeds; poor braking effectiveness and tire skidding at the higher speeds after touchdown; long landing distances; short range and the need with the bicycle landing gear to precisely touch down on both main gears simultaneously to have the landing be a good one. If the nose gear hit first, the airplane could bounce quite high and/or porpoise with sometimes-disastrous results. If the rear gear hit first it could be a hard, "tooth rattling" landing. Early flight-testing addressed these sorts of problems. Early solutions ranged from satisfactory to marginally acceptable. They included a thirty-two-foot drag chute plus a sixteen-foot approach chute, anti-skid brakes, aerial refueling and extensive crew training.

Early flight-testing also almost always identifies some suspected or unknown problems. These included a dutch roll problem, a pitch up at high cruise Mach numbers and a lateral control/aileron reversal problem near the structural design speed limit. A yaw damper and vortex generators were fixes for the first two. Wing spoilers would have solved the aileron reversal problem and helped some of the approach and landing difficulties. However, the Air Force elected to "live with the problem." Again, good training was important.

In the case of the B-47, subsequent flight testing by Boeing and the Air Force and Air Force service usage repeatedly demonstrated that with proper modifications the airplane could be "stretched" further and further and could perform in ways that initially were never even dreamed of. Increasing gross weight was a major item. While these modifications and operating techniques made the B-47 increasingly marginal and not nearly as pleasant to fly, they greatly increased its combat capability and versatility and made it an even more effective weapon system. The SAC crews who flew the very long, demanding, tiring, uncomfortable and sometimes dangerous missions deserve all the thanks we can give them. The

few who disliked the B-47 may well have been thinking of it in that greatly stretched, overloaded condition.

The most apparent modifications to "stretch" the B-47 were:

- Increasing fuel capacity from 9600 gallons on the B-47A to as much as 16,318 gallons on the later production airplanes which had two droppable external wing fuel tanks which each carried 1780 gallons of fuel.

- Increasing from a design gross weight of 125,000 pounds on the B-47A to an eventual operating gross weight of as much as 230,000 pounds.

- Increasing takeoff thrust with J-47 engine improvements from 5200 pounds to 7200 pounds with water-alcohol injection and the incorporation of a droppable external rack carrying thirty-three ATO (assisted takeoff) rockets producing 33,000 pounds of thrust for twelve seconds.

In spite of such major growth throughout the B-47's life, the wingspan and area never changed from the 116-foot span and 1428 square foot area of the XB-47's wing. At 230,000 pounds the wing loading was a phenomenal 161 pounds per square foot.

Operational changes also enhanced the effectiveness of the B-47 – frequently at the expense of such things as service life. Among such changes were low-level operation; the LABS toss bombing maneuver, ground and airborne alert. (stories on pages 131 and 133)

The operational life of the B-47 was shortened by four events:

- The emergence of the B-52 as a replacement.

- Growing reliance on intercontinental ballistic missiles.

- SALT (the Strategic Arms Limitation Treaty), which called for a reduction in our bomber force.

- Structural fatigue problems.

The magnitude of the B-47 structural fatigue problems were both a surprise and traumatic. They reached a real crescendo on 13 March 1958 when the wings broke off two B-47s in normal flight – one at Tulsa and one at Homestead. In the days, weeks and years that followed, aircraft structural life rapidly became and

still is a major subject in aviation technical circles. Efforts to cope with, understand and solve the B-47 structural fatigue problems resulted in major expenditures of money and effort by the best brains in the world. The B-47 structural problems started a revolution in dealing with aircraft structural fatigue life. The lessons learned then resulted in major B-47, B-52, KC-135 and C-5A modifications and are clearly in evidence today in modern aircraft design and development.

The XB-47 emerged from attracting almost no interest in early 1948 to becoming the biggest peacetime bomber program ever when the last of 2042 B-47 aircraft types was delivered on 7 February 1957. It may very well have prevented the Cold War of the 1950s and 1960s from turning into World War III. The technological innovations and advancements spawned by the XB-47 have literally changed the world through the more than 20,000 of its of descendants manufactured in the last fifty years by Boeing, Douglas, Lockheed, and Airbus. Boeing alone has built more than 13,500 of those large multi-engine swept wing jet aircraft since 1950. It is also interesting that it took some 44 years from the Wright Brothers first flight in 1903 to finally reach commercial aircraft operating speeds and altitudes in the order of 350MPH and 23,000 feet. Then almost overnight the XB-47 increased those to some 600 MPH and over 40,000 feet. While subsequent technological advances have been able to very greatly increase the range and payload of commercial jets, speed and altitude have increased very little in the past fifty years or so. (The Concorde is an exception – but it is not a viable airplane for most commercial air travel.) The jets have made air travel cheaper, faster, safer, more reliable and more comfortable. They have essentially taken over intermediate and long distance travel from boats and trains and have greatly promoted domestic and international travel and commerce by making the world a smaller place. They have literally changed the world with a technology based on the XB-47. SAC with its B-47 fleet was on the cutting edge of those technological changes.

When the XB-47 first appeared in 1947 and 1948, it was characterized by aviation notables in various ways such as: "revolutionary"; "radical"; "strange"; "unique"; "You're Looking at Tomorrow".

During it's service life, most of the pilots and crews loved the B-47. One authority has called it, "his favorite aircraft." Flown correctly and at reasonable gross weights on missions of moderate length, it was an absolute joy to fly. It could however, "bite you in a second" if not promptly corralled at the first sign of some type of troubles – particularly when pushed to the limit and overloaded to the very high gross weights that SAC sometimes demanded. It is understandable why some pilots have made such comments as:

• "I didn't love the B-47. I considered it an adversary that would have killed me if I had given it a chance." (Story on page 66)

• "It was just simply an airplane you couldn't fool with. You had to be with it all the time. When you treated it right, if you were very careful with it, if you didn't push it beyond it's envelope, it was a delightful plane to fly. It could bite you in a minute."

• "You always had to give the B-47 great respect. It was an airplane that would turn on you in a dangerous way very quickly unless you were paying attention."

The B-47's role in the Cold war can be appreciated from the following quotes:

• "It is hard for us to imagine the sustained fear of nuclear war which gripped the world in the 1950s. America's Strategic Air Command waited twenty-four hours a day, seven days a week for the call to defend the nation in the face of a surprise strike from the enemy."

• "Throughout the 1950s, the B-47 served as the lynchpin of America's strategic defense. With the serious threat of nuclear conflict hanging over the world, the Strategic Air Command's massive fleet of 1500 B-47s presented the Soviets with a retaliatory threat they could neither match nor contain."

• "There was no question that the Strategic Air Command's fleet of B-47s with their nuclear power absolutely could not be stopped."

• "It was probably an overkill, but LeMay just did not want the Soviets to underestimate us. He wanted us to have such overkill, such obvious power that they wouldn't start anything."

• "The B-47 fleet Established SAC as the most powerful force in the history of the world."

In recent years with an historical perspective beyond the B-47 as a military airplane, the B-47 has been talked about by renowned aviation authorities with comments such as:

• "As important as the B-47 was as a military airplane and for the military airplanes it sired like the B-52 and KC-135, it was even more important in the commercial world."

• "Boeing's 707 emerged as the world's first truly successful commercial jet – and it's evolution began with the B-47."

• "Basic design characteristics of the B-47 carried through to the 707 and on through to today on the 777. Basic design characteristics trace directly back to the B-47 without any question."

• "The B-47 was one of the most influential airplanes in the history of the world."

• "With military and commercial lineage of undisputed success, the B-47 will forever be one of the world's great airplanes."

• "The Boeing B-47 was the most important multi-engine aircraft of the jet age."

The thousands of men and women associated with the B-47 program helped make history with their participation, contributions and sacrifices. They can be justly proud of their roles in the development and use of that new technology, in being at the forefront of the jet revolution and in very possibly preventing World War III.

Hopefully, the preceding B-47 program overview will make reading *B-47 True Stories* more meaningful and enjoyable by giving the separate often unrelated stories a perspective, a continuity, a cohesiveness and an overall B-47 connection that might not otherwise be apparent.

May you too be fascinated by these remarkable first person stories from a vitally important period in our history.

Robert M. Robbins

True Stories

The XB-47 First Flight

By Robert M. Robbins, Boeing Experimental Test Pilot

"Oh GOD, please help me through the next two hours," was my earnest prayer just before applying power and releasing the brakes.

It was December 17, 1947, coincidentally the 44th anniversary of the Wright Brothers first flight. It was expected to be the day for the long anticipated first flight of the radical, new XB-47. Other than my brief silent prayer, I don't believe that either Scott Osler, my copilot, or I felt any undue anxiety. We felt as prepared as possible under existing circumstances and had great confidence in the superb Boeing people who had designed, built and prepared the XB-47 for this flight. We felt in control of the situation. It wasn't until later, in some cases years later, that we learned of the several dramas that took place that day, not inside, but outside the airplane on Boeing Field in Seattle. For instance, Bob Withington, the very competent aerodynamicist in charge of the wind tunnel testing on the XB-47, told me just a few years ago that he went to the roof of the wind tunnel overlooking Boeing Field to watch that first takeoff. As he watched us taxi into position and momentarily pause at the end of the runway, he said that he mentally reviewed the extensive wind tunnel work that had been done. He was satisfied that everything had been done properly and that the technical data indicated that we had a good airplane. Nevertheless, he confessed that for a brief moment as he looked at the airplane poised for takeoff, the thought went through his mind: "That's a mighty strange looking airplane – I wonder if it really will fly!!" He, of course quickly rejected that untenable thought – but still remembered it even years later! Aerodynamicist Vic Ganzer who had worked closely with Bob Withington had gone to the far end of the Boeing Field runway to also watch the takeoff. He later told Bob that he, independently, had thoughts almost identical to Bob's! Bob and Vic were among the several hundred people on the ramps at Boeing Field and along the road on Beacon Hill to the east of the field who had come to watch the takeoff of that "strange" new airplane. One can guess some of their thoughts. More personally involved was my wife, Ann who was with my boss N. D. Showalter on the Boeing Field ramp. She was more than 8 months pregnant with our son who was kicking heck out of her tummy! Anxious moments for her/them too. But I'm getting ahead of my story.

In the year and a half preceding that December 17, Scott Osler and I had been deeply immersed in preparing for that first flight. Many features of the XB-47 had never before been combined in a single airplane and many of them were totally new to Scott and me. We had a lot to learn and there were also some tough operational decisions to be made. There were no simulators in those days except for the totally irrelevant Link Instrument Trainer. We had to use the training and familiarization opportunities that were available and mentally integrate them and hope that we could avoid any unpleasant surprises.

In the introduction to this book I touched on the principal B-47 areas that were different from previous airplanes. They needed to be seriously considered and dealt with before Scott and I made the first XB-47 flight. Following are some of the things that we did to prepare for that day:

• The General Electric TG-180 Jet Engine: – As part of their development and test program, GE put a TG-180 on a trapeze in the bomb bay of a B-29 so that it could be lowered into the airstream in flight and operated. I flew on the B-29 and made air starts, acceleration checks, etc. It was the only TG-180 flight experience we had until we flew the XB-47. Later, during ground testing before we flew, I made all the engine runs to get as much TG-180 jet engine operating experience as I could. It also gave me assurance that none of the engines had been inadvertently over temped by someone. George Martin, the XB-47 Project Engineer even humored me by having a huge spring scale inserted in a cable tethered to the rear landing gear so that we could directly measure engine thrust. That simple test helped raise my uncertain confidence in jet engines!

• XB-47 Approach and Landing Characteristics: – Bill Cook, our very competent XB-47 Boeing aerodynamicist told us how to fly the #1 XB-29 to simulate the expected XB-47 approach and landing characteristics. The excellent simulation gave us a good first hand appreciation for the problems created by shallow approaches, poor engine acceleration, very low drag, high speed touchdown, poor braking and a long landing roll.

• XB-47 Elevator and Rudder Forces: – The full size empennage for the #2 XB-47 with elevator and rudder controls in an aft body type enclosure was tested in the full scale Moffatt Field wind tunnel as part of the engineering design development. Bill Cook had Scott and me "fly" the elevator and rudder and switch the hydraulic boost on and off. It gave us a good feel for what to expect in the way of control forces and the effect of a hydraulic boost failure.

• Bicycle Landing Gear: – We flew a B-26 on which the Air Force had had Martin install a bicycle landing gear. It was named, "The Middle River Stump Jumper" and we learned it could live up to its name!!

• Jet Airplane Experience: – Scott and I each flew a P-80 at (then) Muroc AFB for about seven hours. We each made a JATO takeoff using two bottles rated at 1000-lbs. thrust for twelve seconds to give us confidence in the eighteen JATO bottles we would have available on the first XB-47 flight five months later. That was the only jet airplane flying we did prior to the XB-47 first flight.

• Ejection Seats: – We each took a sixty foot high "ride" in the ejection seat test rig the Air Force had going up the wall of the structural test building at Wright Field. It was a real BLAST!

• Lombard Crash Helmets: – Boeing bought these specially made helmets to maximize our survival chances in case of an accident. Unfortunately even that was unable to save Scott two years later when an XB-47 canopy accident killed him.

• Ultra Flexible Wing: – Boeing built and wind tunnel tested a flutter model of the XB-47. It could be "flown" manually (with restraints) from outside the tunnel. Bill Cook had us "fly" that model in the wind tunnel so that we could see the extreme flexibility of the wing (up to 17 1/2 feet at the tip) and the weird gyrations of the nacelles that would take place in rough air. Later, when it did happen in flight, we were delighted to have been prepared for what would otherwise have been a very startling experience.

• Total Access: – For well over a year before we flew, we had totally free, unrestricted access to all the Boeing people who had anything to do with the XB-47: – Management, engineering, manufacturing, quality control, etc. We freely asked and they answered questions, made suggestions, gave us all manner of data and drawings, and listened to our suggestions. There were no handbooks when we first flew. We learned the airplane "on the job," – in the engineering department, in the factory and at home on the living room floor pouring over system and other drawings at night. The aerodynamicists provided us with estimated performance data. We developed our own checklists, operating procedures and flight plan. The camaraderie and cooperation was magnificent. It was a great team in the true sense of the word.

As we learned more about the XB-47 and what we could expect from it, first flight considerations were also evolving. The airplane was being built at the Boeing plant at Boeing Field in Seattle. Boeing Field was the obvious place from which to fly it. However, the anticipated XB-47 characteristics and the Boeing Field environment were not nearly as compatible as we would have liked. In addition to the usual concerns about the first flight of any new design, the XB-47 was considered by many to be a radical airplane and it certainly embodied several known characteristics that could be troublesome. As we have seen, they included a quite shallow approach path, high landing speed, poor braking and stopping capability, poor and erratic engine acceleration and a high rolling moment due to yaw. The latter could make it more difficult to control an airborne airplane at low speeds in the event of unsymmetrical thrust from an engine failure or just a delay of an engine coming up to power on a refused landing.

And Boeing Field was far less than ideal. Its single runway was a little short with obstructions off both ends and along both sides. Any emergency landing on surrounding terrain would be a catastrophic crash. We would have loved to have been able to use the huge Muroc (now Edwards) Flight Test Center in California. We even considered the possibility of barging the XB-47 down the Pacific coast and somehow getting it overland to Muroc. We also considered other alternatives such as barging the airplane to the Whidby Island Naval Air Station. In the final analysis the difficulties, risks, costs and delays involved in such alternatives and the existing competitive environment ruled them out.

The one first flight alternative that was appealing was to take off from Boeing Field with the intention of flying 160 miles east and making the first landing and doing subsequent flight testing at the closed but usable Moses Lake Air Force Base. We had used Moses Lake during World War II for some of the more hazardous XB-29 and other flight-testing. It was close to ideal with wide, 10,000-foot long runways, clear approaches, very few obstructions, sparsely populated and lots of relatively flat terrain in the area. There was a good hangar available. It was a relatively short drive from Boeing resources in Seattle. Otherwise, the facilities were pretty austere with World War II barracks and pot-bellied coal stoves for heat! But those inconveniences were the least of our concerns.

After settling on Moses Lake, we set about doing detailed planning for the XB-47 first flight. My overriding first flight objective was to "GET IT UP AND GET IT DOWN UNDAMAGED" – hopefully at Moses Lake. If we could do just that, we would learn a lot and be in an excellent position for continuing our flight-testing.

Among the things we planned to do on the first flight toward achieving that goal of "get it up and get it down undamaged were to:

• Take off with only enough fuel to get from Boeing Field to Moses Lake with the gear and flaps down. We intended to retract them but that should give us enough fuel reserve for almost any emergency. At the same time it would give us a light enough airplane to hopefully be able to make an immediate emergency landing back on Boeing Field should that be necessary.

• Install a yaw meter in the pilot's instrument panel and a yaw string just ahead of the windshield to facilitate holding zero yaw in the event of an engine failure.

• Install a millivoltmeter and selector switches at the copilot's station connected into the engine fire warning light circuits to help distinguish any real engine fire from a false alarm. (We had no false alarms during taxi tests but had three within a minute on the first takeoff!)

• Take off on runway 13, not 31, to avoid the most heavily populated areas.

• Carry a full complement of 18 JATO bottles, which, in an emergency, could give us 18,000 pounds of thrust for 12 seconds – an 80% increase in thrust.

• Avoid flying under instrument conditions or in darkness. We set a 2 PM deadline for takeoff because darkness comes early in December in Seattle.

• Cross the Cascade Mountain range and cruise at 15,000 feet unpressurized but on oxygen.

• Install a simple "heads up" attitude indicator to help precisely establish the proper longitudinal attitude for landing. It was merely a thin horizontal line across the windshield that I could line up with the horizon or far end of the runway.

• Not move the throttles from full open until we reached cruising altitude as long as the engines were running properly. I was still wary of jet engines and wanted to avoid doing anything that might have an adverse effect.

If we were granted the luxury of a reasonably uneventful flight, there were several areas we hoped to explore at a safe altitude before starting a descent for landing at Moses Lake. The purpose would be to provide us with flight information that would help us better cope with problems that might arise before landing.

Those areas included:

- Determining the stalling speed, amount of stall warning and stalling characteristics with flaps and gear up and down and power on and off. This would let us pick the best approach speed with a high degree of certainty.

- Determining general handling qualities and airplane controllability on 6 and 5 engines, flaps and gear up and down, engine power on and off, control surface hydraulic power boost on and off.

- Determining if the abrupt loss of one or more power boost units would cause any controllability problems during the transition from boost on to boost off and then back to boost on.

- Make simulated landings and go-arounds boost on and boost off at different engine power settings. If there were suitable clouds to "land on" it would make the practice landings even more realistic.

Finally everything was ready – except for the weather, which held us up for 4 days. On Wednesday morning, December 17, 1947 the Seattle area forecast was hopeful – broken clouds by about noon. But by noon all the weather stations in the eastern Washington area anywhere near Moses Lake were "zero-zero", dense fog. This conflicted completely with reports from our people at Moses Lake who, by noon were telling us that it was completely clear. Air Force Captain James Fitzgerald had brought a P-80 from Muroc to photograph and fly chase for us. He offered to make a weather recon flight to Moses Lake. We were ready, waiting in the cockpit when he returned at 1:30 after a forty-five minute flight. He confirmed the information we had: there was a completely clear thirty mile diameter hole centered over Moses Lake with ground fog beyond. He said it looked good to him – he'd go. I decided to go! Unfortunately on landing, his landing gear hit a runway light, which prevented the P-80 from flying formation with us to Moses Lake.

A few minutes later we were in position on runway one-three cleared for take-off, ready to release the brakes. My prayer to God to, "please help me through the next two hours" was most sincere – and I suspect that I was not alone in that appeal. Hundreds of people had labored long, hard and creatively to produce this radical airplane which was now entrusted to Scott and me. While our confidence was high, no one could really be sure what the next hour or two would bring. Farthest from my mind but another indicator of existing attitudes was Boeing's unsolicited offer to pay Scott and me $15,000 premium pay for flying the forty

hour Phase I XB-47 flight test program. My share was $10,000, a year's salary. 30% was payable after the first flight. My boss, N.D. Showalter had told me that this was not flight hazard pay; it was compensation for "exceptional flying ability" or something like that! It was unnecessary to discuss that point further – we both knew why it was given to us! We had all done everything we could think of to make this flight successful. We would now find out. Incidentally, this would be the first flight of a new airplane for both Scott and me.

Brake release and initial acceleration was normal – no different than many of the high speed taxi runs. However, at 90 mph #2 engine fire warning light came on. With virtually zero time to make a go-no-go decision, I chopped the throttles and began braking. Scott quickly determined from the millivoltmeter readings that it was a false alarm. With 2 PM fast approaching and in spite of warm brakes, we decided to immediately make a second takeoff attempt. We did not find out until three months later that our brake capacity was less than expected. Had a second refused takeoff been necessary with the warm brakes, it might have spelled trouble.

On our second takeoff attempt, Scott was ready to immediately read the millivoltmeter. #2 fire warning light came on again at 90 mph and was quickly followed by #3 and then #5 fire warning lights. Scott immediately confirmed them as false alarms with readings leveling off at about 15 millivolts – just barely high enough to light the fire warning lights, which we could now feel comfortable about ignoring. That millivoltmeter was worth its weight in gold! Without it we would have been in a real quandary about what to do.

After unstick and a surprisingly fast initial climb, the airplane controllability felt good. The landing gear came up without incident. At 190 mph we attempted without success to raise the flaps. With the engines running fine at full power I didn't want to touch the throttles. I pulled the airplane up fairly abruptly to keep from exceeding flap placard speed and then reduced airspeed to 160 mph where we were able to begin bringing the flaps up on the emergency hot wire system. More later about the reaction of people on the ground to this pull up.

Our turn to the east and climb through breaks in the clouds to 15,000 feet on top was exhilarating, beautiful and awesome with majestic Mt. Rainier off to the south. The total absence of vibration was delightfully new to us. It was all a real joy. We could see and felt sorry for the A-26 far below us, which had hoped to take in flight photographs of us. It was struggling to try to keep up. It finally caught up with us on downwind leg at Moses Lake. Things were going well and obviously we were tremendously enjoying this fantastic experience.

Upon reaching 15,000 feet eastbound toward Moses Lake we started through the test conditions that we hoped to accomplish on that first flight. When we reached the Moses Lake area we could see the dense ground fog still surrounding that

thirty mile diameter clear area over the airport. While keeping a wary eye on that fog we successfully finished all the testing we hoped to accomplish except for a couple of minor conditions that we felt unimportant in view of the excellent results we had already had – and we felt it prudent to get on the ground and not tempt the airplane or weather any farther. The landing was uneventful. I was so comfortable I didn't even make a low pass down the runway as a prelude to landing. What few problems we had were easily dealt with and caused no apprehension for Scott or me. Most of those that we identified were minor and easy to fix: sensitivity adjustment to the fire warning lights; slip clutch adjustment to the wing flap motors; minor control surface trim adjustments; a bad buffeting problem gear down with the forward landing gear doors at higher speeds (this was a persistent problem); severe outrigger gear shimmy was a bad shimmy damper.

However, a major potential problem that fortunately did not catch us was the weather. Less than an hour after we landed, Moses Lake was "socked in" with dense fog. That thirty mile diameter clear area over Moses Lake, which had enticed us to fly even though it was surrounded by fog for hours, had quickly closed in! And there were no instrument landing aids. My decision to fly made some two hours earlier at Boeing Field was probably one of the luckiest and at the same time one of the more foolish decisions of my life. It could have been catastrophic! To my knowledge, I was never criticized for it – perhaps because everything else went so well and we got away with it! I have to believe that God had his hand on my shoulder.

Not only did we meet our first flight goal of "get it up and get it down undamaged," we did it with no significant difficulty. That achievement is a real tribute to the many people who worked so hard to make that first flight the huge success that it was.

An even more important tribute to the many people involved with the B-47, both civilian and military, is the fact that the XB-47 evolved into the very important and superbly successful airplane that it became. A full page advertisement that Boeing placed in eight major national magazines (Time, Newsweek, etc.) in the first four months of 1948 showed a picture of the XB-47 with Scott and me, gave some narrative and sported a headline that touted, "YOU'RE LOOKING AT TOMORROW!" At the time it seemed far more like publicity hype than fact. However, the advertisement's prediction became true with a scope far beyond the wildest imagination of almost anyone at the time. That December 17, 1947 first flight of the XB-47 provided the foundation for and in fact launched the jet transportation age with the momentous changes throughout the world that it has brought in the last 50+ years.

As successful as the first flight was, we had barely scratched the surface. Still ahead was a very great deal of engineering, development, wind tunnel and flight-testing to solve both known and yet to be found shortcomings and to capitalize on the exceptional growth potential the basic XB-47 design was found to have. A special tribute is owed especially to the United States Air Force Strategic Air Command people who coped with the shortcomings of that first generation big jet and demonstrated so well how effective it could be. Their stories are the basis of this book.

POSTSCRIPT

At the beginning of this XB-47 first flight story, I briefly related the reactions of Bob Withington, Vic Ganzer and my wife, Ann. There is more to tell of feelings and reactions taking place on the Boeing ramp that afternoon. You may enjoy empathizing with some of them.

Bill Cook was the brilliant, creative senior aerodynamicist on the XB-47. He has written an excellent book entitled 'THE ROAD TO THE 707' in which he talks a lot about the XB-47's evolution and history. It includes much of the philosophy and thinking driving many of the decisions. I'd like to excerpt a few of his statements that will help explain some of the tone at Boeing Field that afternoon:

- "Because of the highly experimental nature of the XB-47 project as well as the necessity of keeping costs as low possible....(and)....Since the unknowns at the time were considerable, starting the XB-47 program off by building a prototype saved both time and money. .... Short cuts in drawing and manufacturing were numerous. ... Two prototypes were to be built so that flight testing could be continued uninterrupted if one prototype crashed before sufficient data had been accumulated a situation which had occurred when the 299 crashed at Wright Field in 1935." (Note: In the twelve years before the XB-47 flew, Boeing had lost three Chief Test Pilots: Les Tower in 1935 in the crash of the 299/B-17 prototype; Julius Barr in 1939 in the crash of the first 307 Stratoliner and Eddie Allen in 1943 in the crash of the XB-29. In addition, a year and half after the XB-47 flew, Scott Osler was killed in an XB-47 canopy accident that "had been undetected waiting to happen" since the first flight!) ... "It was desired that flight testing begin as soon as possible to quickly expose any hidden defects as well as to explore opportunities. .... Even though every imaginable happenstance had been analyzed, it is difficult to adequately describe the level of anxiety that existed among the engineers who were witnessing the first takeoff of what was a radically new design. ... To those of us on the

ground who had worked on the project, the first XB-47 lift-off was a very tense, dramatic event. ... For reasons of safety, the early XB-47 flight tests were restricted with respect to speed and special maneuvers so that the project team could learn as much as possible about normal operations with minimum risk."

I am told that when we started the takeoff roll, Bill Cook was proudly in the front row of people on the ramp. As we picked up speed, Bill, apparently subconsciously, lowered his head and shoulders a little and retreated backward a step or two into the crowd as if to say, "I'm concerned. I'm not sure I want to be identified with this." When we became airborne and obviously had good control, Bill reportedly eased forward, erect, head high as much as to proudly say, "That's my baby." And Bill could be proud. He not only contributed greatly to the XB-47's technical success but also in helping Scott and me prepare for the first flight.

Harold Mansfield, in his book 'VISION', relates that Chief Aerodynamicist Ben Cohn was under double pressure, his wife expecting a child, and this (first flight). She had tried him with the question, "If they both happen at once, where will you go?" "Look," said Ben, "I love my family. But this baby down at the field, I've been working on it for four years."

My wife, Ann, did not pressure me with any such questions. She knew that I had a job to do and fully supported me. But, with all her courage, she too had her apprehensions. In addition to the normal concerns she was over 8 months pregnant.

Ann was among the 100 or more people on the Boeing ramp as Scott and I taxied toward the north end of the airport. Many more people were elsewhere on the field and east on Beacon Hill overlooking Boeing Field. Ann was with my boss; N. D. Showalter, Chief of Flight Test. Ann's mother and dad were also there. Our 1 1/2 year old daughter was at home with a baby sitter. Our son would be born in about 3 1/2 weeks (or sooner!) but was letting Ann know he was present too by doing a lot of squirming around.

A few weeks earlier I had taken Ann down to Boeing Field to proudly show her the airplane. In my enthusiasm I "had put my foot in it" by showing her how flexible the wing was by easily moving the wing tip up and down some ten inches with just my hands and arms. She was horrified. "You're not going to fly THAT" she exclaimed! I tried to calm her concerns by explaining why it was that way and that there was nothing to worry about. I explained that even if worst came to worst, I could fire the eighteen JATO bottles, get 18,000 pounds of additional thrust for twelve seconds, pull up and get enough altitude to fire the ejection seat and safely parachute to the ground. She would shortly recall that alternative with some terror.

When we aborted our first takeoff attempt because of the fire warning light, Ann had been holding my boss's hand. He tried to assure her that it was planned. She knew better and later said that furthermore N. D. was not only squeezing her hand very hard but that his hand was shaking noticeably – a real giveaway!

A few minutes later when we did take off, we left a normal, but at the time unexpectedly dark trail of black smoke as one looked down the flight path at the departing airplane. Then, when the flaps wouldn't come up and I elected to hold the speed down by abruptly pulling up, Ann was sure that I was in trouble, had fired the JATO, and was getting altitude to bail out. All this time our son was kicking heck out of Ann's tummy. We knew that we were not in trouble, but she feared otherwise. It's tough on those left helplessly on the ground.

The first 6 months of XB-47 Phase I Boeing flight testing at Moses Lake were spent evaluating the airplane, getting data, fixing a few immediate problems such as a dutch roll problem and insuring that we had a safe airplane to turn over to the Air Force for their traditional Phase II flight test evaluation. In his previously mentioned superb book, Bill Cook nicely summarized that Phase I program when he said: "Considerable progress was made during the testing in the spring of 1948, and no major problems surfaced. ... The first test flights were directed at insuring the safety of the airplane. Stability and control were checked with small increments in speed. Stall approaches revealed good lateral control and no pitch-up tendencies. ... The airplane's low speed characteristics and its high-speed longitudinal stability proved to be satisfactory. ... Hours in the air were being accumulated at a good rate. There was practically no publicity, nor outsiders inquiring on how we were doing. Quite possibly, our competitors within the industry had already written off the Boeing XB-47 as being doomed to failure. At Moses Lake we had first-hand evidence to back up our enthusiasm, but our optimism about the XB-47 being the production airplane that would displace the piston-engine bombers had not spread back to Seattle."

Each of our close-knit team members at Moses Lake reported results frequently to our respective bosses in Seattle but they pretty much left us alone. It was a delightful way to work. We were essentially our own bosses with no one "breathing down our necks."

The only real drawback was that Seattle and Air Force management seemed almost complacent and showed little interest in the XB-47. Even when our early XB-47 performance data was showing considerably better results than expected, Boeing management seemed preoccupied with what they felt were the most important airplanes, like the B-54. It was a greatly improved version of the B-29/B-50 which the Air Force was also very interested in. In his book, Bill Cook relates how he was astounded when his boss, George Schairer, the instigator of the swept

wing on the XB-47, told him, "You can play with your experimental airplane but the bread and butter of Boeing is the B-54."

That situation changed abruptly in less than an hour on the afternoon of July 19, 1948 when on his 4th Air Force Phase II flight, Major Guy Townsend took Major General K.B. Wolfe for a short ride in the XB-47 (see Major Townsend's story on page 30). With some considerable difficulty, Boeing President Bill Allen and Air Force Colonel Pete Warden had persuaded Gen. Wolfe and his group to briefly stop by Moses Lake on their return to Wright Field from Seattle where they had been reviewing the B-54 program with Boeing. The first ten of the eventual 2040 B-47 production airplanes were ordered within days.

As stories in this book demonstrate, pilots' attitude toward the B-47 varies widely: some loved it; others hated it. In his book, Bill Cook makes some interesting observations related to that and the later growing airline interest in jets. He comments that: "flight testing revealed that (B-47) landings required considerable skill. One interesting aspect of the landing deficiencies of the bicycle gear was that jet airplanes earned a bad reputation generally. Later on when the airlines became interested in the possibility of jet transports, the airline pilots would ask the military pilots about the flying characteristics of jets in general. They received discouraging answers. Jet airplanes were viewed as being only for the most highly trained pilots with the top skills." There was obviously much work to be done before commercial jet transports would become the very safe and popular mode of transportation that they enjoy today.

I still thank God and the many Boeing people who made that first flight such a great success.

Longitudinal Stability With Flexible Wings – A Fatal Defect!!

By William H. Cook, Boeing XB-47 Aerodynamics Unit Chief

By December 1946, sixteen months after the change to the swept wing and eight months after the contract signing, the basic structural design was almost complete and the heavy parts of the wing were being made in the shop. Everything seemed to be going well when an apparently fatal defect was suddenly uncovered. The stress expert, Zeke Grey, was making a final analysis of the wing strength when he told my expert, Vic Ganzer, that the bending of the very flexible swept wing at maximum speed caused the center of lift to move inboard, and thereby also forward. This shift was sizable, amounting to the equivalent of a CG shift of fifteen percent.

Pilots have always been very aware of the CG in loading an airplane-if the CG was too far back the airplane could be dangerously unstable and if too far forward it could be uncontrollable. The equivalent of a fifteen percent shift between high and low speeds could not have been accommodated by a reasonably sized tail on the XB-47. Shifting the CG in flight by transferring fuel between tanks, as occasionally was done later in supersonic airplanes, was so impractical that it was not considered. This problem shocked us, providing as it did an example of our ignorance. Maybe this was the reason why there were skeptics outside of Boeing, possibly evidenced by the XB-47 not being copied. At that time, the XB-47 aerodynamics group was composed of about six engineers.

Just after this shock Vic Ganzer quit to teach at the University of Washington. Times were pretty hectic and higher-ups were keeping a watch on the XB-47, often interjecting conflicting orders. The XB-47 was far from being viewed as the cornerstone of Boeing's future. The "bread and butter" was to be a very long-range bomber with a "compound" engine, a combination of piston and turbine engines. Nevertheless, the XB-47 was the most interesting project in sight. After Vic left, I wandered around in a daze trying to think of a solution. I surmised that, while wing tip would bend up when the airplane was subjected to G forces, thus causing the center of lift to move forward and the airplane to pitch up, the body must also deflect downward due to the large weight of the aft body. The resulting increase in the angle of attack of the horizontal tail might help counteract the effects of the wing bending.

Without much hope, I walked across the drafting room to Zeke Grey's desk, and asked, "If the airplane weight was evenly supported in the manufacturing jig, what would be the change in the angle of attack of the horizontal tail when the aft body support was removed and the tail was allowed to droop, while the wing center section remained clamped in the jig?"

Zeke replied, "I can't tell you now, but come back after lunch."

A few hours later Zeke had a number. How he did this in so short a time remains a mystery. As I walked back to my desk, I multiplied Zeke's number with the number representing the horizontal tail's effectiveness in controlling pitch. Within the very small aerodynamics group longitudinal stability and control was my job, so this was easy, and before I was back at my desk, I realized that the body's downward deflection exactly counteracted the fifteen percent shift of the wing's center of lift at high speeds. The emotional relief I felt is hard to describe. Without this unexpected answer, we all would have been looked upon as the stupidest of engineers, as this was exactly the type of problem the theoreticians had been afraid of, and it could have killed the whole project because changing the design at that late stage would have been impossible.

The relationship between the upwardly bending wings and the downward bending body with its rear control surfaces was carefully checked during the first high-speed flight tests. Small increments in speed were made, during which the ratio of elevator angel versus normal acceleration G's was measured. This ratio remained constant when corrected for the increase in elevator effectiveness with speed, showing that the longitudinal stability was maintained up to maximum speed.

After the early XB-47 flight tests showed no signs of trouble, the NACA at the Ames Laboratory in Sunnyvale, California asked for the data needed to compute the effects of flexibility. This data covered the stiffness of the wing and body structures and the distributions of weight in the wing and body. Some time later a national high-speed conference was held at the Ames Laboratory, where a paper was presented that described this analysis. The conclusion drawn was that the body deflections counteracted the wing deflections. In the discussion following, George Schairer made a comment to the effect that "This did not just happen," inferring that we had designed this to be so. The human mind has a tendency, with time, to rationalize critical achievements. I arrived at the moral, "Don't admit luck, rather, claim superior intelligence."

This story was excerpted from the book "The Road To The 707" ISBN 0-9629605-0-0 by permission of the author.

The K.B. Wolfe Story

By B/Gen Guy M. Townsend, USAF Experimental Test Pilot (Ret)

In the summer of 1948, I was sent with Captain Jack Ridley to Moses Lake Air Force Base, Washington to conduct Phase II flight-testing on the XB-47.

In way of background, the B-40 series E; B-45, B-46, B-47, B-48 had all been contracted for before the end of World War II and the decision had been made to put the B-45 (North American) into production.

M/General K.B. Wolfe, head of production at Wright Field, was at Boeing Seattle for a B-50 Spares meeting and Mr. William Allen (Boeing President) and Lt. Colonel H. E. (Pete) Warden got their heads together and convinced General Wolfe that he ought to stop off at Moses Lake to see the XB-47. Needless to say, General Wolfe had never been in a jet airplane. Pete had said to me, "You know, Guy, K.B. Wolfe has been seeing airplanes go faster and faster but it has always been true airspeed by going to higher altitude. He has never seen 460 miles/hour on the air speed indicator." It was a very hot summer day at Moses Lake (July 19, 1948) Jackie and I were in the airplane. We did not have any air conditioning. We

were sweating like mad. K.B. Wolfe stood at the nose of the airplane with his back to the airplane. He kept telling Warden he did not want to buy the airplane because it was not a medium bomber and it was not a heavy bomber and did not have any place in the force structure, and so forth and so on. He finally ended up telling Pete, "Damn you, I'll go ride in the airplane just to get rid of you." So we took off and leveled off and let him fly the airplane a little bit. He was impressed with the light aileron forces, high climb speed, and rate of roll. We came back in and buzzed the field and pulled up into a big Chandelle and landed.

Then he got out of the airplane. I did a JATO (Jet-Assisted Takeoff) for him. He turned around to Pete and said, "You'd better come to see me in the morning." Pete did, and the next day he ordered the B-47As. That is a far cry from all of the bureaucrats we have to go through now to put an airplane into production. The airplane turned out, as we all know, to be a very successful airplane. There were a couple thousand of them built, and it was really the first jet bomber that we had. There is no way that the Boeing Company could have done the B-52 or the 707, if they hadn't had the B-47 experience.

Flight Testing the XB-47

By James A. Fraser, Boeing Experimental Test Pilot

My part in the initial testing and evaluation of the XB-47 was that of back-up pilot to the primary flight test crew of Bob Robbins and Scott Osler. I began to get flight time within a few weeks after the first flight of the aircraft (XB-47#1 6065) on 17 December 1947.

By 9 March 1948 it was time to get a good airspeed calibration prior to conducting our first definitive performance tests on the XB-47. To accomplish this, the Air Force sent a calibrated P-80 from Muroc (now Edwards) AFB to Moses Lake to fly formation with us. We were surprised and delighted when the P-80 landed at Moses Lake the afternoon before and out stepped Chuck Yeager, the famous World War II fighter ace and the man to fly faster than the speed of sound less than five months earlier. Fortunately for me, Bob Robbins, the Project Pilot had a cold and a plugged ear and felt he shouldn't fly. Rather than delay the calibration, he asked Scott and me to make the flight. To everyone's surprise, Chuck in the P-80 could not stay up with us in the XB-47 at near full throttle. That night they worked on the P-80 engine thinking something must be wrong with it. (There wasn't!) The next day Bob was OK to fly and he and Scott in the XB-47 and Chuck in the P-80 tried again to get the high-speed points – without success! The

XB-47 was clearly faster than the P-80. That was the beginning of the recognition that the XB-47 performance was even better than expected. A fun sidelight revolves around the characterization by some that Chuck is not only a fine person and a superb test pilot, but he is also very competitive and is somewhat disdainful of civilian and bomber test pilots. It has been a source of great amusement that Chuck Yeager in a modern fighter could not keep up with a civilian test pilot flying a bomber!

Until the first B-47As came off the production line in 1950, all flight-testing was done on the two XB-47s. Phase I Boeing flight-testing was done between 17 December 1947 and 21 July 1948 by Bob Robbins, Scott Osler and myself. Phase II and other Air Force testing was done between 8 July 1948 and 23 June 1949 by Major Guy Townsend or Major Russ Schleeh and their copilots. Scott Osler and myself did phase III Boeing testing between 20 November 1948 and 11 May 1949. Among many tests in Phase III was initial work on aerial refueling and deceleration brake chutes. Both of these capabilities were incorporated in production B-47s.

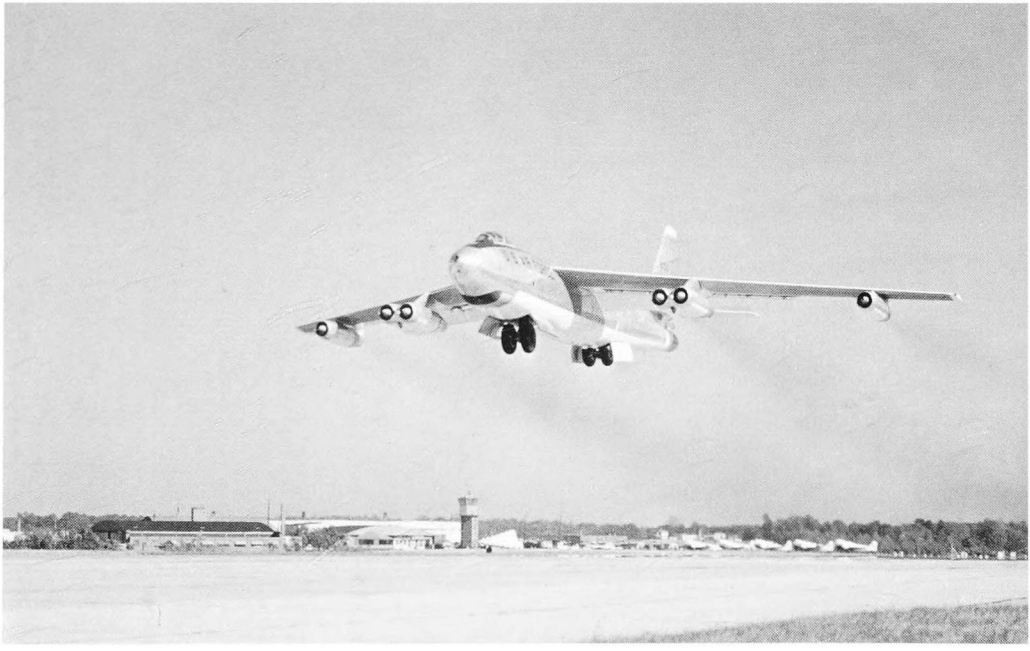
One interesting experience occurred in early 1949 when Scott Osler and I were conducting fuel management tests at about 5,000 feet in the vicinity of our test base in Eastern Washington (Moses Lake). Scott turned the airplane over to me and got busy up front checking out the complex system of switches, which controlled the fuel system. In the event of one or more engine failures or fire, proper manipulation of those switches would shut off fuel to the bad engine (s) and permit all the fuel to be used by the remaining operating engines while keeping the airplane center of gravity within limits.

I was peacefully cruising along when suddenly all six engines quit cold, turning the bomber into an instant 120,000-pound glider. While I maneuvered the "glider" into position for a (so-called) dead stick landing at the base, Scott, at about 1500 feet finally got the fuel back to all six wind milling engines simultaneously and we motored our way back to the base.

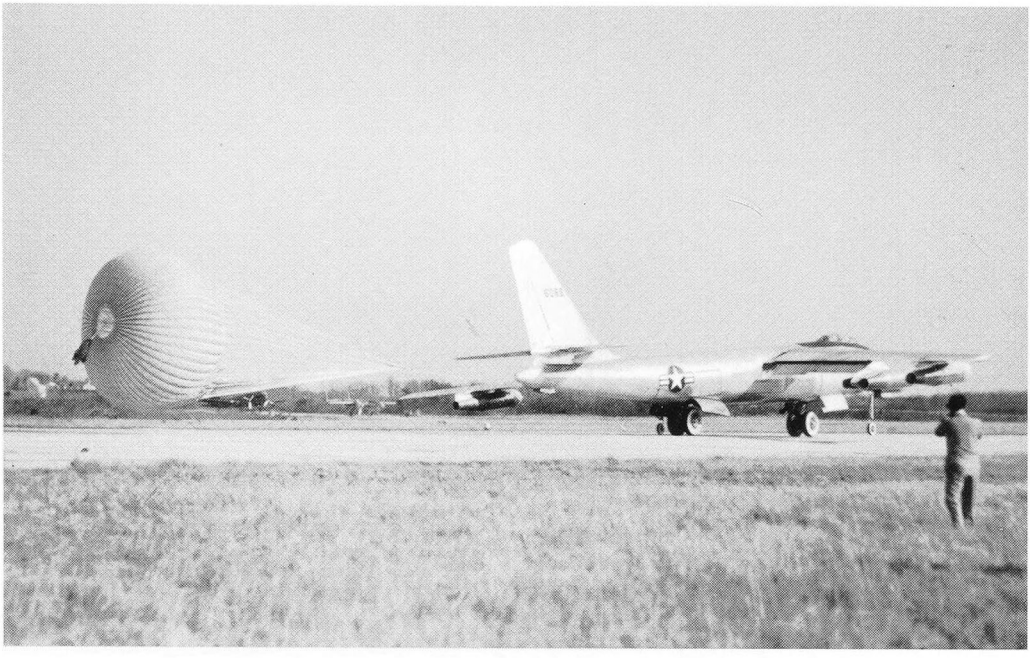
Flying the XB-47 at high speeds of up to 450 miles per hour (MPH) through the rising thermals in the hot Eastern Washington desert area was an unique experience, for instead of an intolerably bumpy ride, the several feet of wing tip deflection on the long "thin" very flexible wing permitted a surprisingly smooth ride. For practical reasons this flexibility feature could not be fully carried over into the follow-on commercial versions of the aircraft (707) and the flying public experienced only a compromise benefit.

Quite a while into the Phase III test program, an autopilot was installed on the #1 XB-47. On 11 May 1949 it was to be flight tested for the first time. John Fornasero, Chief of Flight Test, making his first flight in the XB-47 as an observer,

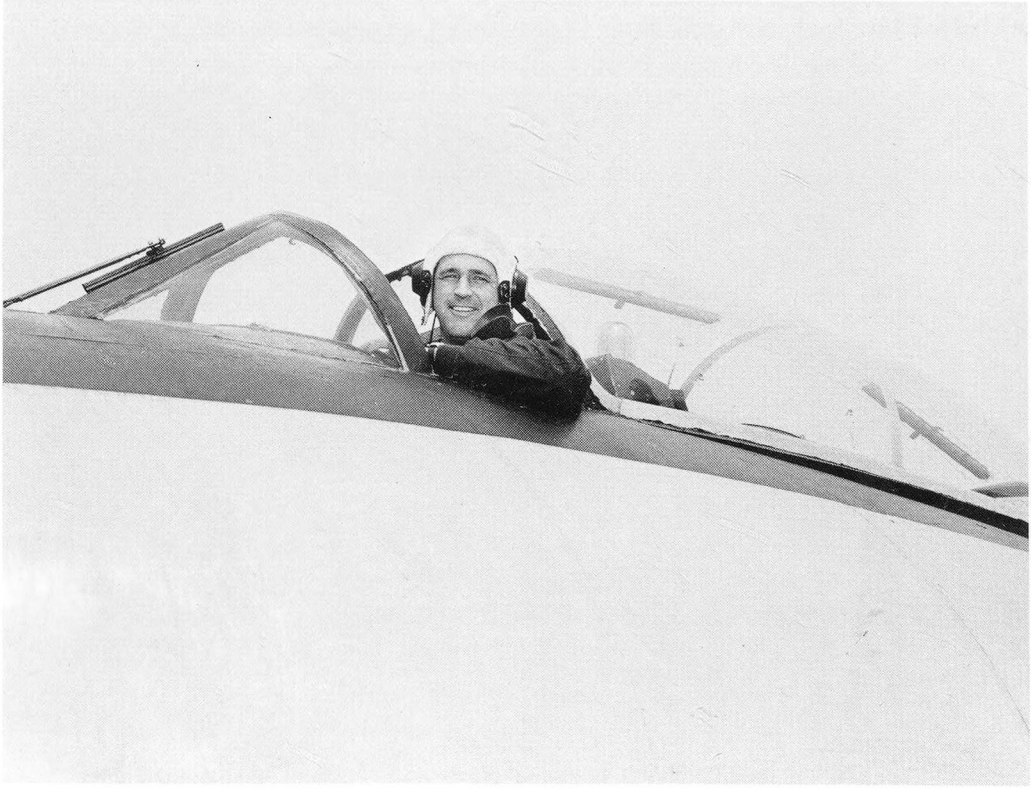
NB-47E (s/n 24100), call sign Nucar 3, arrives at Pease AFB on 12/20/1977. This was the last operational flight of an active duty B-47.



A 98th BW B-47E takes off from Lincoln AFB.



Majors Russ E. Schleeh and Joe Howell land the #1 XB-47 at Andrews AFB, MD on February 8, 1949. Their average speed of 607.8 miles per hour broke all coast-to-coast speed records.



Major Russ E. Schleeh looking out of the open cockpit of the #1 XB-47.

Boeing test pilots Scott Osler, aircraft commander, and Jim Fraser, co-pilot in the cockpit of the #1 XB-47. A defect in the canopy's design would later result in an in-flight accident that killed Osler.

A B-47E (s/n 15251) taxis onto the runway at Thule, Greenland in 1958.

A B-47 production line at Boeing's Wichita, KS facility, April 1951.

The graceful lines of an RB-47E in flight.

WB-47B (s/n 12115) flown by MATS in the weather Reconnaissance role.

Various model B-47's awaiting "Milk Bottle" upgrades at Tinker AFB, OK.

Hundreds of mothballed B-47's awaiting destruction at the Davis-Monthan AFB graveyard.

B-47E (s/n 520166) *"Spirit,"* piloted by Major General J. D. Moore and Lt. Colonel Dalè Wolfe, take-off from the China Lake Naval Test Center; headed for Castle AFB, CA on June 17, 1986. This was the last flight of any B-47.

WB-47 (s/n 17066), the last operational USAF Stratojet, being towed following restoration at the Seattle Museum of flight.

Major Guy M. Townsend shakes hands with General Joe McNarney, Commanding General of Air Material Command following Major General K. B. Wolfe's first flight in the #1 XB-47 on July 19, 1948. General Wolfe (on left), Captain Jack Ridley and Elliott Merrill look on.

SSgt. Harold Denmon, Crew Chief on B-47E (s/n 532121) *"Spirit of Orange County"* during the 1959 SAC Bomb-Nav Competition held at McCoy AFB, FL.

A B-47B(s/n 00062) and an early B-52G (s/n 80159) of the Wright Air Development Center (WADC) flying in formation.

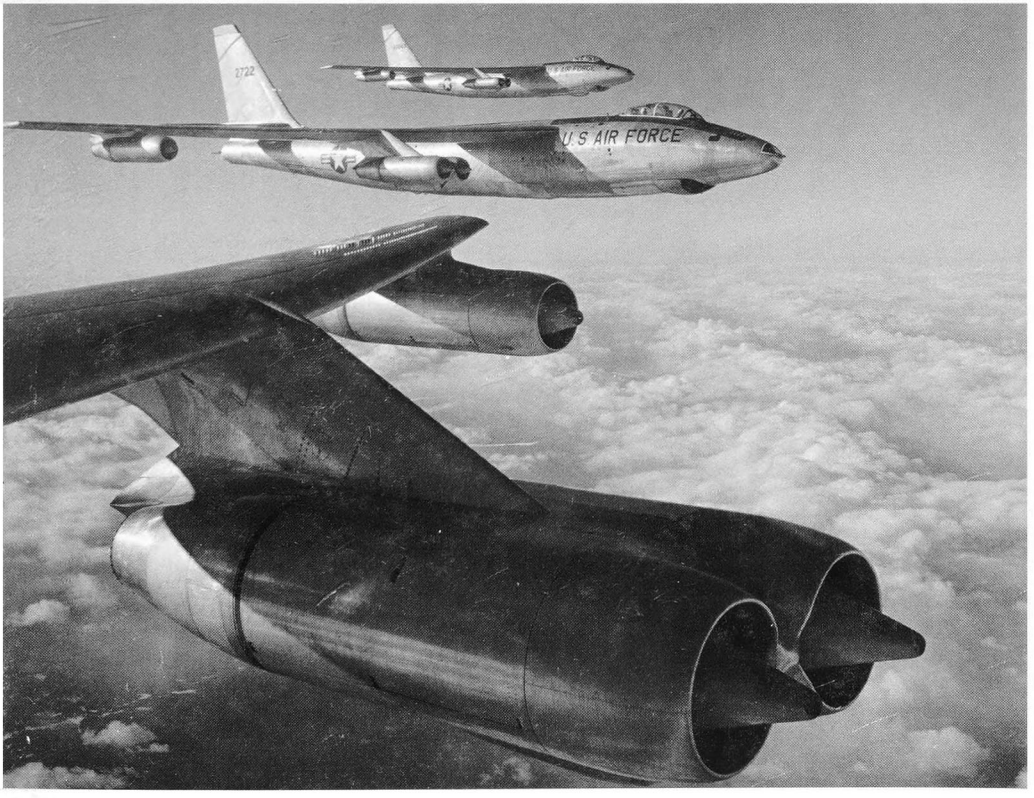
Hal Bowman's B-47E (s/n 20564) after veering off runway at Lincoln AFB. A ruptured hydraulic line was the culprit.

Robert Ottman (left) and his 301st Bomb Wing crew, participants in "Operation Redwing", a series of above ground thermo-nuclear weapons tests conducted at Bikini in 1956.

Winners of the G.E.Trophy at the 1956 National Air Races.

An EB-47E(TT) of the 55th SRW based at Incirlik, Turkey. Three of these modified B-47E's were used to collect telemetry data at Soviet Ballistic Missile launch sites.

B-47E (s/n 20242) accident scene at Sidi Slimane January 31, 1958. Although the alert aircraft was consumed by fire, the high explosive component of its nuclear weapon failed to detonate.



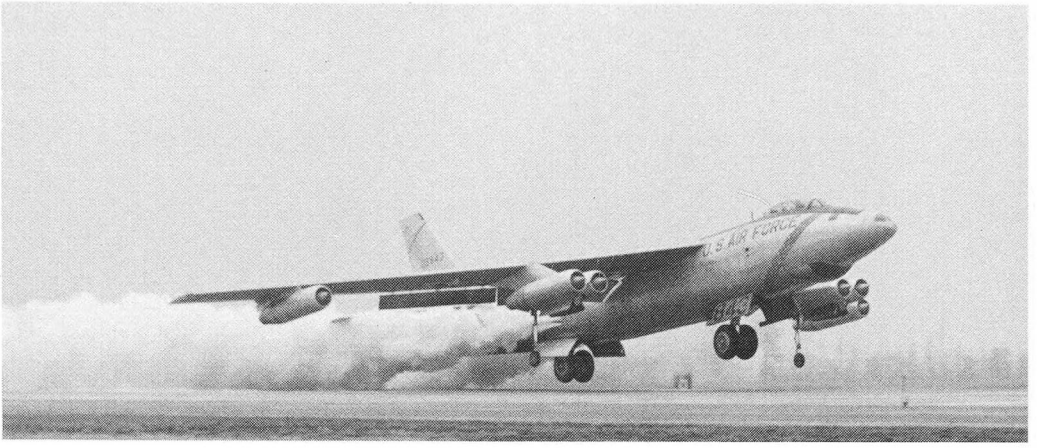
Clifford Goodie's 1957 USAF Photo contest first place winning photo shows three Lockbourne RB-47E's in formation.

A B-47 co-pilot.

B-47 flight crew bringing their personal equipment to a waiting aircraft.

Pilot's view of a KC-97's refueling probe during an aerial refueling.

Navigator Clifford Goodie's "Self Portrait," taken in the navigator's compartment of an RB-47E.



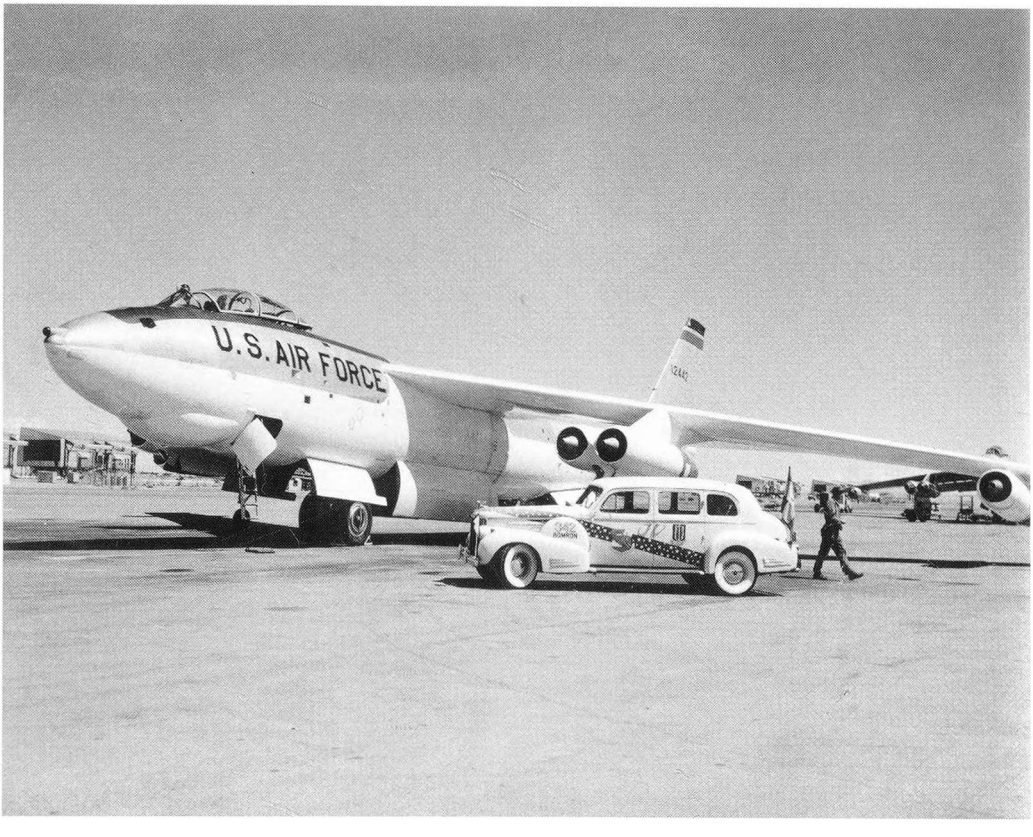
AN RB-47E of the 91st SRW demonstrates the awesome power of a JATO takeoff.

Single Point Refueling. Ground crew refuels a B-47 prior to take off.

The cramped quarters of the pilot's station can be seen in this photo taken from the cockpit aisle.

Routine engine maintenance

A night time mission for the crew of an RB-47E at Lockbourne AFB.



A B-47E (s/n 12442) of the 342 BS with a LaSalle limousine formerly owned by Shirley Temple and used as a flight line taxi. This aircraft and its crew were lost during a mission from Upper Heyford on May 16, 1956 off Land's End, UK.

together with the autopilot company representative, accompanied Osler and me. Osler had the basic autopilot controls at the pilot's station, and also an emergency cut-off switch on his control wheel. No cut-off switch was installed on my control wheel in the rear, which proved to be a serious omission. Unknown to anyone, there was an accident just waiting to happen since the first flight on 17 December 1947. Scott started out by making shallow turns and mild climbs and descents with the autopilot working smoothly. He then progressed to a more steep climbing turn to the right. Suddenly, the tandem canopy over our heads detached from the latching mechanism with an explosive roar. The back of the canopy lifted way up, broke the grasshopper actuating arms, slammed backwards and then down hard to its partially open taxiing position. In a microsecond, a rush of air ripped off Scott's custom-built protective helmet, and the front of the canopy momentarily dipped down into the cockpit and hit his head killing him instantly. Fortunately for me, the canopy did not come free from the airplane or I might have been decapitated. All this time, the airplane is in a climbing turn at 8,000 feet, and 300 MPH, with the controls locked in a vise grip by the autopilot. We were heading for a rollover dive. I frantically signaled the autopilot representative by pointing to where my cut-off button should have been. He got the message and pushed the cut-off button on Scott's wheel. I am now able to fly the aircraft, allowing Fornasero to pull Scott out of his seat and lay him in the narrow side isle. John got into the front seat to land the airplane, but having never even been on an XB-47 flight before, it would have been a really challenging and hazardous learning experience. I went forward and signaled him to trade seats. From my familiar pilot's position, I headed in for the landing while John alerted the ground crew by shielding his microphone against the incredible amount of noise. The touchdown went well with the fire and aid trucks attempting to pace us down the runway.

Scott and I had been close buddies during all the previous years in Flight Test, and we had brought my wife Audrey, and his wife Marge, over from Seattle for a close-up look at the operations and a relaxing weekend. Before anyone contacted them, I went to the base doctor, got a handful of strong sedatives, made Audrey take two pills, and broke the news. Then I found Marge. Scott and Marge had been married for a short eight months.

It had been planned to transfer the entire XB-47 flight test program to Wichita where B-47 production was just getting under way and where future XB-47 and B-47 flight testing was to be conducted. There would be a lot of flight-testing to be done in the years ahead. However, I had deep roots in Seattle and chose not to move my family to Wichita. I spent the next year doing engineering and experimental flight test work for the company in Seattle on the B-50, XC/C-97 and commercial Stratocruiser programs before moving on to several rewarding jobs in

Boeing Headquarters. My final assignment was Director of Industrial Relations for the Seattle Division. This encompassed Security Guards and Firemen, Personnel Records, Training, Safety, Counseling and ironically, the Employment Office where, in 1941 before Pearl Harbor, I had spent many unsuccessful days waiting in line at dawn hoping to get any kind of menial swing shift job to help me get through college.

After accident related modifications were made to the #1 XB-47, Major Guy Townsend flew it from Moses Lake to Wichita on 16 June 1949. Major Townsend was the Air Force Experimental Test Pilot who had flown most of the Air Force evaluation tests. A week later on 23 June, Guy took General LeMay for his first B-47 flight at Wichita. The B-47's future was assured.

After Scott's 11 May 1949 accident, Tex Johnston was the first of several engineering test pilots hired by Boeing for the XB-47 flight test program in Wichita. After improved engines were installed on the #2 XB-47, John Fornasero, Chief of Flight Test for Boeing and Tex flew it from Moses Lake to Wichita on 12 October 1949 to begin the next phase of what would become a very extensive flight test program.

Another clear recollection that I have illustrates how unbelievable the XB-47's performance was to many in those early B-47 days. In 1949 I was asked to speak to a B-29 (Atomic Bomber) Group in Albuquerque, New Mexico while there on other business. After clearing with the Commanding Officer on audience security clearances, I told the pilots about the XB-47 running away from the P-80 flown by Chuck Yeager during an airspeed calibration flight and about the XB-47 having crossed the United States at an average speed of 607 miles an hour. At the time this was still unreleased information. The pilots started groaning, cat calling and making insulting remarks about company people peddling a bunch of crap. Many in this same group were probably assigned to B-47s later. However, no one ever called to apologize! I am also reminded that the cavalry also once thought that nothing could best a horse!

The XB-47's Record Setting Flight in February 1949

By Colonel Russ Schleeh, USAF Experimental Test Pilot (Ret)

The Flight Test Division at Wright Field, Dayton, Ohio, was directed to fly several of the latest bombers and fighters (XB-47, YB-49, B-45, F-86 and others) to Andrews Air Force Base, Maryland, for a presidential and congressional review of the air shows aircraft. Major Joe Howell and I were given the duty on the XB-47.

We arrived at Moses Lake, in the state of Washington (which was where most of the initial flight tests were conducted) on a snowy day in February. Neither Joe nor I had flown the XB-47. The plan allowed me to get a checkout ride, which included a couple of landings during a one-hour orientation flight. We made contact with the master weather analysis group in Washington, DC and asked them to select one day out of a three-day window showing the most favorable winds. We wanted an opportunity to make the airplane look good and were anxious to give the flight our "best shot," and of course Boeing Aircraft fully supported the idea.

We devised a "how-goes-it" curve showing zero fuel at destination, the fuel required at various points along the route, and the reserve fuel to be gained during the letdown. Boeing Aircraft personnel asked us if we wanted new engines for the flight, but we decided that the current engines were a known factor and new engines might introduce something unknown. The aircraft and fuel trucks were left out in the cold during the night so that all the fuel possible could be loaded on board. The aircraft was towed to the end of the runway to allow minimum fuel to be used for taxiing. I remember someone saying that safety was paramount and thought about that statement several times during the flight.

The XB-47 had pre-production engines (J-35s) with much reduced thrust compared to the production engines (J-47s). The XB-47 had no vortex generators thereby allowing airflow separation at the outer wings, which caused the aircraft to pitch up when a limiting Mach number was reached. We flew as close as we could to that Mach number. There was no anti-skid brake system to prevent the tires from blowing if there was heavy braking during strong crosswinds when the wings could not be kept level. Our only nav-aid was a low frequency radio compass, which required a lot of tuning as we passed rapidly from station to station.

As luck would have it, the weather was not too favorable for a "One-hour" pilot, a "Zero-hour" copilot, and an experimental airplane; but we were motivated to beat the B-45 and YB-49 that were heading to the air show. We felt confident and were committed to a "go" situation.

The takeoff roll seemed to be unbelievably long and used most of the runway. Shortly after takeoff, we were on instruments and remained on instruments for about ninety minutes. The power stayed at 100% for the entire flight except for a twenty-minute period midway during the flight when we briefly fell behind on the "how-goes-it" curve. The flight was uneventful other than for several little pitchups that occurred due to inattention on my part.

Letdown was started approximately 100 miles from Andrews AFB at limiting Mach number followed by maximum indicated airspeed at the lower altitude. We arrived with sufficient fuel for a quick pass over Andrews AFB, an approach and a landing and a go-around if necessary. We experienced a stiff, gusting crosswind

during the landing, and the brake chute failed to deploy. We used the entire runway and blew two tires when decelerating.

During the flight we had a very good tailwind, and our elapsed time was three hours and forty-six minutes, both of which pleased us very much. Our average speed of 607.8 miles per hour broke all coast-to-coast speed records.

The First 39 Engine B-47 Takeoff

By Curtis E. McNay, Boeing Experimental Test Pilot

On August 14, 1954, I flew a test flight in a B-47 at Boeing Field Wichita, KS, to demonstrate an ATO (assisted take-off) using 33 rockets that were designed to produce a minimum of smoke. Earlier ATO tests had been conducted using eighteen bottles, nine on each side, mounted in the fuselage just aft of the wing root. These rockets produced a lot of white smoke, which, for all practical purposes, would blind anyone attempting to take-off next as in a MITO (minimum interval take-off) string. Also, this white smoke had a high content of picric acid – not friendly to aluminum structures. Further, gross weight could be increased if more thrust were available. Our test utilized a "horse collar" rack, fitted under the fuselage just behind the aft landing gear, which sported the thirty-three bottles.

The test plane was #52-509 and the crew consisted of myself as pilot, Hugh Lawrence in the back seat and John McCort at the Navigator station in front. Flight planning had one added step that of predicting the speed for initiating firing the bottles. Gross weight was light (as I remember 152,000 pounds). Plan on 90 kts. with unstick ten seconds later at 140 kts. Incidentally, try to determine if any undue pitch exists or stick force is required at unstick before remaining five seconds of thrust runs out and pull up for climb out is accomplished (and don't exceed the 195 kt. flap placard either).

Flight test personnel were positioned along the runway (laterally away at a safe distance). The first part of the takeoff was normal and as Hugh called 90, I flipped the switch. You know ten seconds go by fast! Pitch, no problem. Start up. Thrust runs out but something is strange. Stick forces are suddenly real heavy. Hugh has started flap retraction per our plan, but I have my left arm around the wheel to pull on it! Look around the cockpit! Red light on control boost – retrim! Ah, forces relieved BUT it's obvious that I am flying manual controls.

Conversation in the cockpit, we have no outside contact. Switch to VHF secondary. It was on McConnell frequency and we heard the Tower say something

about picking up the trash left on the runway – not too reassuring. Switched to Boeing tower and Mac (Ken McKee, I think) in the tower says you had a fire on the belly of the plane and it went out (Somewhat reassuring but found out later Mac had given us instructions to fly the traffic pattern and land. Probably a good thing we didn't hear that transmission).

We requested someone in the air to meet us at 10,000 feet to inspect the damage. First arrival was Major Reichal on a B-47 acceptance flight. His assessment was that our tail could depart anytime – not too reassuring. Then word was passed to us to continue flight to consume fuel and get gross weight below landing max of 125,000 lbs. While accomplishing this we were joined by Dick Taylor, flying a T-33 chase plane, and carrying a Structures Engineer Gordon Davidson. They gave the damaged area a close look. Their evaluation was more favorable and a decision was made to move the CG (center of gravity) slightly aft, as it had been moving slightly forward during the fuel burn/gross weight reduction period. After considering some of the options, yes, including the alternate descent method (bailing out), a straight-in approach for 18 right from about twenty miles north of the field was initiated. Landing configuration was established and Dick Taylor escorted us to touchdown. As I tried to flare, the unpowered elevator was apparent and the touchdown was more of "an arrival." As we hopped down the runway, Dick's comment was "Well, we know the tail will stay on!" We stopped on the runway adjacent to the entry to the Boeing ramp with more fire equipment and personnel around than I have ever seen – that is reassuring.

Looking over the bird we found that the fire started behind the rack and continued to burn off all of the fuselage skin between the lower longerons back to the tail turret. How hot the lower longerons got is anybody's guess. The main radio gear had just been dumped and this must have been some of the debris the tower made reference to just after we took off. The brake chute had deployed and melted off in an instant – we had on-board cameras that showed this happening. Hydraulics in this area were singed and inoperative.

Several ideas regarding fire initiation came up in the ensuing investigation. I think the most logical one was that there was lots of unburned fuel being ejected from the bottles, which then ignited, adjacent to the fuselage. Again, our onboard camera film seemed to confirm this.

Flight test also found out that the arsenal providing the bottles for the test had never fired more than three at one time in their ground tests.

End of tale.

The Boeing XB-47D Turboprop

By Raymond L. McPherson, Boeing Experimental Test Pilot

Although the B-47B was considered combat ready in the early 1950s, it was range limited. Jet engine development was progressing rapidly at the time, but available engines could not provide the range improvement needed.

Because of the efficiency of a propeller in moving air, turbo prop engines, even with their more complex design, were also being developed.

In order to evaluate the feasibility of large turboprop engines, the Air Force awarded a contract to the Boeing Company in 1952 to modify two B-47B airplanes to serve as test beds for the YT-49 turboprop engine. The modifications were intended to be a technology demonstration for future aircraft, not a retrofit for the B-47 fleet.

The basic engine for the YT-49 was a British designed Sapphire axial flow turbojet. Wright modified the engine by adding a gear reduction for the propeller and a third turbine stage. The Curtiss Electric four bladed propeller was fifteen feet in diameter with automatic feathering and ground reversing. This combination was rated at 9,600 equivalent shaft horsepower and was considered to be the most powerful turboprop in the world at that time. During the test program, the engine was derated to approximately 8,500 equivalent shaft horsepower. The term "Equivalent Shaft Horsepower" was used because some positive thrust was obtained from the engine exhaust.

The modification to the B-47B airplanes consisted of replacing the four inboard J-47engines with two YT-49 engines. The two outboard J-47 engines were retained in their original configuration. A B-47 pilot sitting in the cockpit would feel comfortable because only minor changes had to be made. The most noticeable, of course, was the throttle quadrant with only four throttles.

Each turboprop throttle had a flight idle detent and a ground idle detent. On the ground, each propeller could be reversed by pulling its throttle aft of the ground idle detent. It was found on landings that ground idle provided excellent drag and reversing was not used often during the landing rollout, but it was very effective. Eight twenty four inch chord; 7.5-foot long propeller blades provided a lot of flat plate area. Propeller RPM (revolutions per minute) increased from approximately 1000 RPM to 1200 RPM when advancing the throttles from flight idle to full power. The propellers were in effect constant speed during flight. This feature allowed a rapid increase in power because the engine RPM was already up, and the blade angle change could be accomplished in three to four seconds. This compared to approximately twelve seconds to accelerate a J-47 engine under similar conditions. This feature provided excellent air speed control, particularly during

final approach, and eliminated the requirement for a drag chute. Another feature of the propeller, during flight, that proved to be very reliable, was its automatic feathering capability. A low torque level on the engine could be sensed, and the prop blades would feather automatically if the low torque persisted. The concept seemed like an accident ready to happen, but, after some flight experience, it turned out to operate as advertised, and there were no failures of the system. On the first flight of the XB-47D, a longitudinal pulsing or chatter was felt during approach for landing. It was found that the initial torque setting for the auto feathering system was a little high and the props were attempting to feather. By setting the torque sensor for a low negative value, the chatter was eliminated.

The automatic feathering system was good protection against inadvertent flameouts. The high drag build-up resulting from a windmilling propeller was rapid, and the resulting yaw produced large structural loads on the aft fuselage and empennage. A 310-knot indicated airspeed placard was necessary. At least two flameouts were experienced during the flight test program, and the torque sensing automatic feathering operated perfectly with no pilot effort. Some pilots may remember a similar temporary placard on the B-47 due to outboard engine seizure caused by inadequate bearing lubrication.

During flight, the propeller blades, after feathering, always went to the same blade angle, and the pilot could not change that angle. Depending on the airplane's speed at the time, a feathered propeller could rotate in either direction. To prevent this and to further reduce drag, an engine brake, actuated by the pilot was available to stop the rotation. This system was unreliable and resulted in several engine changes during the flight test program. The mechanical break-up of the brake usually contaminated the engine oil supply.

After several months of ground running to calibrate the throttles, engines, and propellers and to conduct taxi tests, the first airplane (2103) was ready for flight. The first flight out of Boeing Field in Seattle, Washington, was made August 26, 1955. The Boeing engineering test pilots were Ray McPherson and Lew Wallick. As it turned out, Ray, Lew and Captain Charles Bock, a test pilot from Edwards AFB, were the only pilots fortunate enough to fly the XB-47D. The airplane systems were checked out, and, because the landing gear would not retract after take off and a propeller governor malfunctioned, low speed handling qualities were evaluated en route to Moses Lake, Washington, where the flight test program was to be conducted. The second flight was three days later and included propeller feathering checks and engine air starts. Power on and power off stalls were also conducted. The airplane handled well, and compared favorably with the B-47B. Cockpit noise levels were noticeably higher however. Tufts on the top of the wings helped to evaluate airflow over the top of the wing during both low speed and

high-speed conditions. A camera, mounted in a pod on top of the vertical stabilizer, recorded tuft activity.

The third flight on September 1, 1955 required a climb to 32,000 feet from takeoff. As the airplane was leveled off, and the throttles were reduced, a persistent longitudinal pulsing of approximately one cycle per second was observed. It lasted for approximately ten seconds then smoothed out. Nothing on the cockpit instruments could account for it. The condition occurred on several more flights and always above 30,000 feet. Airflow measurements were taken in the engine inlet and prop spinner because of concern about airflow separation in the engine inlet, but the flow was satisfactory. About four flights later the problem came to a head on a sustained flight to 35,000 feet. At about 33,000 feet both turbo prop engines flamed out within about two or three seconds of each other without retarding the throttles. The two propellers feathered immediately, and the drop in cockpit noise was the first indication of a problem. Since a decision had been made at the start of the flight test program to always have the two J-47 engines running during flight, they were set at about 95% RPM and a slow letdown towards Moses Lake was started. Two air starts were attempted on both YT-49 engines during the descent, but they were unsuccessful. The descent continued to approximately 10,000 feet where level flight could be maintained on the two outboard engines. It was now about thirty minutes after the flameouts. While the pilots were circling Moses Lake and discussing a landing technique with ground personnel, it was estimated the rate of descent with gear and flaps down with full thrust on the outboard engines at best approach speed would be approximately 1500 feet per minute. There was 10,000 feet of runway available, so it was decided to land. Prior to landing, it was decided to try one more air start using the emergency ignition system. As luck would have it, both engines started and a normal landing was made.

After an extended lay-up, it was determined that the problem was caused by the YT-49 engine oil cooler. The cooler consisted of a radiator with an automatic air-cooling shutter. The engine fuel line was also wrapped around the radiator for additional oil cooling. It was referred to as an automatic fuel-air heat exchanger, and there were no oil temperature gauges or air shutter control switches in the cockpit. During sustained high power settings, such as in a climb to high altitude, the engine oil overheated and that caused the engine fuel to overheat, resulting in a vapor lock and flame out. Once oil temperature gauges and shutter control switches were installed in the copilot's station, he manually controlled the oil temperature, and the flame out problem disappeared. Apparently it took 30-35 minutes for the engine oil to cool enough on the letdown to prevent a vapor lock in the fuel system. The use of the emergency ignition system during the successful air starts was incidental.

The second airplane (2046) made its first flight February 15, 1956. It landed at Moses Lake and the flight test program continued until June 26, 1956. On that particular day, both airplanes flew, but not at the same time. Because of parts shortages, it was normal to exchange parts just to keep one airplane flying. The first airplane (2103) was often using parts from 2046 and was referred to as the "Old Goat." Some nose art on 2103 at the time shows it eating 2046. Engine and propeller silhouettes were also stenciled on the noses indicating how many were changed, but after five or six of each were sprayed on, someone from higher up didn't appreciate the humor, and the stencils were removed.

After the June 26 flights, neither airplane flew again. Both airplanes were disassembled at Moses Lake and transported to China Lake.

The handling characteristics of the XB-47D were similar to the B-47B throughout the flight envelope, and it was a pleasure to fly when the turboprop engines and propellers were operating properly. It seemed that different failures were experienced on just about every flight. They included such things as turbine blade tips rubbing the case, repeated engine and brake failures, propeller governor failures and inability to unfeather propellers. Limiting flights to two hours was considered. The longest flight was four hours and ten minutes. The airplane was flown to the B-47 mach number placard of 0.84 at 40,000 feet. Cruise data obtained showed that the maximum range of the airplane with the outboard engines at idle was about twice that of the B-47B, but the maximum range speed was at 0.7 mach number instead of 0.74, and the max range cruise altitude was about 6,000 feet below the B-47B. A takeoff at a brake release gross weight of 180,300 pounds exceeded the B-47B calculated runway distance by approximately 1,000 feet. Propeller efficiency definitely degraded at take off speeds above150,000 pounds.

Aerial refueling behind a KC-97 was evaluated, but some pitch instability, when in the refueling envelope, was noticed, and the test was not considered to be satisfactory. The conditions were not evaluated on any other flights, but an aft center of gravity on the XB-47D was thought to have contributed to the instability. Speed control was excellent, requiring very little throttle movement while in the refueling envelope.

During the flight test program, 2103 flew 16 flights and accumulated thirty-nine hours. 2046 had six flights for a total of twelve hours. Because of the propeller and engine problems that were encountered, a total of fifty-one flight hours in ten months was not impressive. A lot was learned, however, about large turbo prop engines. It was difficult integrating a proven jet engine with a propeller without sacrificing reliability. The basic British Safire was a proven engine with over 800,000 flight hours, but adding the components necessary for a turbo prop seriously degraded reliability.

Back in the 1950s it may have been difficult to imagine how aircraft engines would become what they are today. There are still many requirements for propellers, but the turbo fan engines have proven themselves. It is believed that the negative data from the XB-47D flight test program was significant in showing the way to the very reliable present fan-jets and turbo props.

B-47 Ejection Seat Tests

By Lew Wallick, Boeing Experimental Test Pilot

Beginning in January 1954, I was assigned the task of piloting a B-47 (51-2052) to fire copilot seats, with anthropomorphic dummies in the seat, from the airplane in flight. Of course, this required operating with the canopy removed; and, as usual with normal intelligent scheduling, it occurred in the middle of winter in Wichita, Kansas. Doing the checklist, starting engines, and taxiing to the runway with typical 15-knot wind blowing was cold work. Interestingly enough, once exceeding about 250 knots indicated airspeed it seemed to feel warmer in the cockpit than at lower speeds, and better than being on the ground. My "live" crew was another pilot riding in the navigator seat to ELGE the landing gear down if needed.

The flights were flown from the Boeing test facility at McConnell AFB with the seat fired over the Smokey Hill bombing range. A chase plane accompanied the flights to photograph the seat trajectory (and maybe document the loss of fin if things didn't go as planned).

The test conditions were 13,000 feet/368 knots, and 13,000 feet/427 knots, all in level flight. After the level flight firings, test conditions were 13,000-feet/310-knots/1.35 g, 13,000-feet/310-knots/1.65 g, and 13,000-feet/310-knots/2.0 g.

In April I fired a Weber seat from a B-47E (52-411), and in June I fired another Weber seat from a different B-47E (51-5244).

The second attempt in January resulted in a misfire – I don't know the reason – but the flight was reflown successfully the next day.

These flights resulted in the fastest open cockpit flights in my career.

B-47 Downward Seat Ejection Tests

By Jesse P. Jacobs, Jr. Colonel USAF (Ret)

The first series of Downward Seat Ejection tests were terminated in 1953 or early 1954 due to shoulder and collarbone injuries suffered by the human subjects at around 400 Knots Indicated Airspeed (KIAS). I arrived in Bomber Test at Wright-Patterson AFB (WPAFB) in February 1954 and was assigned as copilot on the next series of tests, which started in April 1954. I was a Captain at the time. The project pilot was then Captain William T. Campbell, Jr. He was the project pilot on both series of tests. Then Capt. Ralph Lusk was the copilot on the first series of tests.

After the human subjects suffered injuries, it was apparent that a redesign of the seats would be required to reach the desired test point of 425 KIAS at 10,000 feet altitude as the human subjects were unable to hold on to the ejection seat D-ring thus allowing their arms to flay out at the higher speeds. The redesign was relatively simple. It turned out to be a spring, which allowed a very small amount of movement of the ejection seat D-ring that activates the mechanism for ejection of the seat. This allowed enough shock absorption of the high dynamic pressures (Q-force) generated by the high-indicated airspeeds, thus stopping the flaying of the arms of the human subjects.

We conducted tests on fully articulated dummies at WPAFB until the Aero-Medical Laboratory engineers/scientists were convinced we were ready to do tests again using human subjects. We were ready to move to Eglin AFB for the next series of tests with human subjects over water. As the copilot on this project, I was responsible for the timing and giving the countdown prior to firing the seat out. A cable was extended from the ejection seat in the nose of the airplane back to the copilot's position so that I could fire the seat out at the proper time and place. We also used this same system and countdown during the Eglin tests.

The B-47 and three Photo and Safety Chase airplanes moved to Eglin AFB, Florida in July 1954. Elaborate precautions were taken to prevent loss or injury to the human subjects/jumpers during the build-up and final tests. These included spotting crash/rescue boats and crews on Choctowhatchee Bay between Eglin and the Gulf of Mexico to rescue the men after ejection from the B-47.

As this was the second series of tests with extensive use of the fully articulated dummy, the engineers and Aeromedical Laboratory personnel were confident that further tests with live subjects could be done without injury to the jumpers. Four men were used in this set of tests. They were Colonel A.M. "Chick" Henderson, Captain Ed Sperry, First Lieutenant Robert Nielsen and M/Sgt. George Post. The first four jumps at Eglin AFB were made at 10,000 ft MSL. Colonel

Henderson made the first ejection/jump at 380 Knot IAS. MSGT Post made the next jump at 395 KIAS. Lt. Nielsen's jump was at 410 KIAS and Capt. Sperry made the last high speed jump at 425 KIAS, which was the end point we were seeking.

The last two jumps were made by Lt. Nielsen and Capt Sperry out over the Gulf of Mexico at 45,200 ft. MSL based on photo-theodolite data so that they could both share the record which they established at that time. Since all of these tests had to be made with a depressurized cockpit, we had to pre-breathe pure oxygen for about forty-five minutes prior to flight for each high altitude drop to prevent "bends"/aeroembolisms.

Flying the B-47

By Lt. Colonel Edwin C. Ross, USAF (Ret)

I graduated from high school in the spring of 1955 and, the day after our Senior Prom; saw a first-run motion picture called, "Strategic Air Command." In this film, which can still be seen occasionally on late night television, Jimmy Stewart, playing a B-36 aircraft commander, and Frank Lovejoy, as a cigar-chewing, four-star, SAC General, walk into a hanger to see, "... something new." It was, of course, the B-47.

Now, over forty years later, I can still vividly recall that scene. The two actors spoke in hushed, almost reverent, tones as the camera moved slowly over the sleek bomber's graceful shape. The slim, tapered fuselage, over 110 feet long, sloped down towards the tail as the airplane sat on its unique, tandem main landing gear. It looked poised for flight, as if impatient with an earthbound environment. The thin, sharply swept wings and tail surfaces said, *speed* – over 600 miles per hour – equal or faster than first-line fighters of the day. As the first big, pure-jet, swept-wing bomber to go into production, the B-47 projected an image as radical as the XB-70 and SSTs did many years later. Sitting, awestruck, in that darkened theater, I decided that, someday, I would fly the B-47.

Four years later, as a second lieutenant straight out of flying school, I walked across the ramp at McConnell AFB toward a waiting B-47 to begin my career as a B-47 copilot. Three years after that, I upgraded to aircraft commander and spent another three years flying the B-47 from the front seat. This is what it was like.

A flight in the B-47 actually began with mission planning, which was done the day before the scheduled take off. We would meet at about 8 o'clock in the morning and would be issued a mission folder, which contained all the informa-

tion we needed for the flight. This included the serial number of the airplane we would fly, scheduled take off time, and the air refueling track to be used along with the type of tanker airplane, his call sign and the amount of fuel to be transferred. The mission folder also contained the scheduled times to enter a low level navigation route and simulated bomb release times along with the targets and tactics to be used. It would also list the training requirements to be completed during the flight.

Based on this information, the crew would plan the flight, in considerable detail. This included planning the route, drawing up the maps they would use and computing the expected fuel burn along with the airplane's weight and balance and takeoff and landing performance data. The copilot and navigator would also plan any celestial navigation to be done, including deciding which stars would be used for fixes. The pilot and copilot would determine when they could begin using fuel from the auxiliary fuel tanks and which tanks would be filled during the in-flight refueling. The crew would also decide exactly where, and when, during the flight, the required checklists would be accomplished.

By about two or three o'clock in the afternoon, mission planning was completed and we were ready to brief the squadron commander, or operations officer, on what we planned to do. After the briefing was complete, and any questions were answered, we went into crew rest until it was time for the flight.

The day of the flight, we would normally meet at base operations about two hours before the scheduled takeoff time. There we reviewed any changes that may have been made, checked the latest weather forecasts and picked up our flight lunches. Then we would pick up our personal equipment, such as parachutes, helmets and oxygen masks, and report to the airplane about one hour before takeoff.

We entered the B-47 by climbing a telescoping, vertical ladder, which was stowed inside the crew entry hatch on the lower, left, forward side of the fuselage. Going up the ladder, with a parachute over your shoulder, a helmet bag in one hand and a briefcase in the other, took more than a little manual dexterity. At the top of the ladder was the "crawl way" which ran along the left side of fuselage; forward to the navigator's position in the nose and aft to the end of the pressurized compartment behind the copilot's seat.

Up in the nose, the navigator's downward ejection seat normally faced forward. A large radarscope, (eleven inches in diameter as I recall) was stowed ahead and slightly to the left of the seat. The scope could be pulled out and swung toward the center of the airplane when it was in use. Directly in front of the navigator, and along the wall to his right, were his instruments, the radar controls and the bombing and navigational computers. He also had a small table, along the right sidewall, which never seemed to be quite big enough to hold all the maps and other paperwork he needed. The navigator's seat could be rotated to the right to face this table.

There were three windows in the navigator's compartment. One was in the ceiling, almost directly over his seat, and the other two were on each side, forward and lower. However, since the navigator used radar just about all the time, and sunlight made the radarscope hard to see, the windows were normally covered with curtains. It was always nighttime in the nose of a B-47.

The pilot and copilot had upward ejection seats behind and above the navigator's compartment, under the canopy. (SAC liked to call us Aircraft Commanders and Pilots, but we knew a copilot when we saw one.) The floor under these seats was about three feet above the floor of the crawl way and the navigator's compartment. It took a little squirming to get up into the seats.

Once in their seats, the pilots could see amazingly little of the airplane. The rounded nose dropped off quickly, just in front of the windshield, and the copilot's forward vision was almost completely blocked by the top of the pilot's ejection seat and other equipment between the cockpits. By turning around, and looking over their shoulders, the pilots could see the wings and engines, but only with considerable effort.

The crewmembers could not see much of each other either. The navigator, by twisting in his seat and looking down the crawl way over his left shoulder, could see the pilots' feet. The copilot, by straining upward, could catch a glimpse of the pilot's helmet. The pilot had a mirror, on the left wall of the crawl way next to his seat, which he could use to see the copilot – but not very well.

Because we couldn't see each other, good crew coordination in the B-47 required precisely standardized procedures, including interphone transmissions. A number of actions required verbal coordination between crewmembers. We began to develop this coordination during simulator training on the ground and continued to refine it in the air. In the B-47, more than any other airplane I have ever flown, crew coordination could make, or break, the mission.

From the pilot's seat, the B-47's cockpit seemed fairly large but not roomy. You could lean your elbows on the canopy rails on each side. The instrument panel was conventional with flight instruments in the middle, navigation and bombing instruments on the left and engine instruments on the right. However, the B-47 was built long before the standard "T configuration" for flight instruments had been developed. By today's standards, the flight instruments were a jumble. They looked as if they were installed wherever there was room for them.

A row of six throttles was located on a pedestal, on the pilot's right, with a panel containing the controls for lighting, heating and pressurization just ahead of them. The fuel control panel (a plumber's nightmare) was along the right sidewall, behind the throttles. The autopilot controller was normally stowed against the crawl way wall on the left but could be swung out, on an extendable arm, when it was being used.

Two different manufactures; Republic and Weber provided the pilot's ejection seats. All of the pilot's ejection seats could be adjusted in two directions; up, which also moved the seat forward, and down, which also moved the seat to the rear. The difference was that the Republic seats were adjusted manually while the Weber seats had an electric motor to position them. Additionally, the copilot's ejection seat could be rotated 180 degrees to give him access to the controls for the two, 20 mm cannons mounted in the tail. The rudder pedals could be adjusted mechanically, forward and aft.

Preflight checks were comprehensive and complicated; checklists were used religiously. Many checks, such as the ones on the flight controls, required a ground crewman on interphone with the flight crew.

The B-47 had an unusual flight control system, in one respect, which we checked before every mission. The airplane had Fowler flaps, which were positioned full down for takeoff and landing. There were two flap sections on each wing and, when they were full down, the outboard section – called a "flaperon" – worked in conjunction with the ailerons to provide better roll response at low airspeeds. For example, with the control wheel full right during preflight, the ground crewman would call out the control positions which would be: "Left aileron down, left flap and flaperon down, right flap down, right flaperon spilled, right aileron full up." We never told the ground crewmen how we were positioning the controls and check pilots often had ground crewmen call out incorrect positions before check rides to see if we were paying attention to what they said.

We normally started engines thirty minutes before takeoff. This allowed time to check as many systems as possible on airplane electrical power with a little extra at the end to clear up malfunctions, if we had any. During engine start, there was usually a small fleet of maintenance vehicles parked directly in front of us. They were full of maintenance specialists and spare parts ready to try and fix anything that went wrong at the last minute.

Starting engines, as with any jet, was fairly simple but seemed to take a long time when you were in a hurry. The B-47's six, J-47 engines used electrical starter motors, unlike the high-pressure pneumatic starters used in most big jets today. It was possible to start a B-47 with just airplane battery power, but we normally used a ground power unit. I don't remember ever making a battery start in the B-47.

The engines were numbered, 1 through 6, from left to right. Number 1 was the left outboard and number 6 was the right outboard. Only engines 3 and 4 had hydraulic pumps so the normal starting sequence was: 4, 5, 6, 3, 2, and 1. For engine start, the pilot would arm all the ignition switches and then engage the starter for the first engine. As the rpm reached 6%, he moved the throttle from "cutoff" to "start" which turned on the ignition and fuel automatically. The engine would start and the rpm would continue to increase. At about 12 to 15% rpm, the

starter motor would be cut out and the engine could be accelerated to idle, about 40%, by easing the throttle forward while watching the exhaust gas temperature (EGT) carefully. Too much throttle, at low rpm, would guarantee a hot start and just about melt the engine's turbine wheel. During alert starts, when we were trying to get going in a hurry, it was common to have two or three engines spooling up, between 20 and 40%, at the same time.

After all the engines had stabilized at idle, external power was disconnected and the copilot turned on the six, engine-driven generators. (These generators were actually the starter motors, now being driven by the engines instead of the other way around.) Two, engine-driven alternators, on engines 1 and 6, were brought on the line for AC electrical power and the navigator could begin turning on his radar while the pilots checked their radios. If the radar checked out okay, we would be ready to taxi about twenty minutes before takeoff time. Our missions were scheduled and monitored so closely that, if we were late calling for starting engines or taxi clearance, the control tower would call us and want to know what was holding us up.

Taxiing the B-47 was straightforward although, when the airplane was heavy, it took quite a bit of power to get it moving. We had to be careful not to blow over men and equipment behind us. The forward main landing gear was steered hydraulically, through the pilot's rudder pedals, and had three steering modes, which could be selected by a lever next to the pilot's seat. In "taxi," the gear would turn sixty degrees right or left with full rudder pedal deflection. Since the gear was located well behind the cockpit, it almost felt like the airplane was backing up during hard turns. By moving the lever to "takeoff and land," the maximum steering authority was decreased to only 6 degrees to minimize over controlling at high speeds. By lifting a latch and moving the lever full forward – a two handed operation that could not be done accidentally – we could select the "tow" position. This disconnected the steering system and was only used by maintenance people during ground operations.

Wheel brakes were applied by depressing the tops of the rudder pedals and seemed like conventional toe-brakes, but they were a little different. The B-47 had hydraulic, anti-skid brakes on all four main landing gear wheels. However, since the wheels were so close to the airplane's centerline, differential braking could not be used to steer the airplane on the ground. Pushing on any one of the toe brakes applied brake pressure to all four main landing gear wheels.

After the airplane was moving, it took very little power to keep it rolling and we did most taxiing with the engines at idle. If we needed extra power, we'd normally just advance the inboard engines and leave the outboards at idle. Being so far out on the swept wing, the outboards were very close to the ground. At high

power settings, they could act like vacuum cleaners and pick up loose rocks and dirt.

There was no engine run-up, so we were normally at the end of the runway, ready for takeoff, about five or ten minutes early. Since we had controlled refueling and bomb-drop times to make good, we could not take off early. I usually used those last few minutes to look over the flight plan one more time and review the things we planned to do during the next few hours. If the temperature had changed from what had been forecast, the copilot was very busy, during those last few minutes, recomputing the takeoff data.

About three minutes before takeoff, we would request clearance onto the runway to hold for our scheduled takeoff time. Lined up on the runway, the navigator would give a call one minute before brake release and the pilot would begin advancing the power to 100 percent. About fifteen seconds before brake release, the engines would be stabilized. The pilot would check all the engine instruments and report, "100 percent across the board, oil pressure, fuel flow and EGT checked." The engine instruments were positioned so, at full power, the needles were all lined up at the nine o'clock position. This made it very easy to scan them and see if one was out of line.

The navigator would begin a countdown at ten seconds to go. At five seconds, the pilot would turn on the water injection system and, as six warning lights blinked out indicating the engines were taking water, call, "Water on, lights out." As the countdown reached zero, the pilot would release the brakes and takeoff began.

Initial acceleration during the B-47's takeoff roll was painfully slow. A glance at the airplane's history reveals why. The design gross weight of the B-47 was 125,000 pounds. That is the weight at which it was designed to fly and it never changed. The maximum gross weight for takeoff was originally 165,000 pounds, but this was soon raised to 185,000 and then 195,000. When I flew the airplane, its maximum gross weight for takeoff was 221,000 pounds. Since it was still powered by basically the same J-47 engines, which had been installed on all but the first airplanes, the B-47's takeoff performance, at heavy weights, was pretty doggy.

As the airspeed began to increase, the copilot would announce, "Seventy knots ... ready ... ready ... now." On the word "now," the pilot would check his airspeed indicator and, if it were not within 4 knots of seventy, the takeoff would be aborted. At the same time, the navigator would start a stopwatch and announce, "Timing started." A predetermined number of seconds later, the navigator would announce, "Coming up on decision speed ... ready ... ready ... now." This was the last point at which the takeoff could be aborted and the airplane stopped on the runway. As the navigator called "now," the pilot would check the airspeed indicator for the precomputed acceleration check speed, which varied for each takeoff. Timing the

airplane's acceleration from seventy knots to decision speed provided a final performance check. If the airspeed was good, there was no turning back and the pilot would announce, "We're committed."

With the B-47's bicycle landing gear, the airplane was in the proper pitch attitude for takeoff while sitting on its wheels so there was no rotation before lift off. As the airplane neared takeoff speed, the copilot would announce, "Coming up on unstick speed ... ready ... ready ... now." The pilot would apply backpressure to the control column and the airplane would become airborne.

During lightweight takeoffs, it was common for the airplane's aft main landing gear to come off the ground before we reached takeoff speed. However, the airplane was easy to control as it rolled along on the forward main and the outrigger wheels. Ailerons became effective early in the takeoff roll and we could make banked turns on the runway long before the airplane was ready to fly.

Outboard engine failures, after decision speed but prior to liftoff, were a serious problem in the B-47. Several airplanes were lost due to such failures and eventually SAC implemented a special training program to combat the problem.

An engine failure, that late in the takeoff roll, would often be undetected. Acceleration would be a little slower than normal, but there were no performance checks after decision speed to alert the crew to a problem. There would be no noticeable decrease in noise level and no directional control problems as long as the landing gear was on the ground. The airplane would lift off normally and then yaw into the dead engine very slightly. The initial yaw would be almost imperceptible but, because of the B-47's highly swept wings, it would produce an immediate roll in the same direction. This roll would be the crew's first indication of trouble and the pilot would normally try to counter it with opposite aileron. Unfortunately, aileron alone could not stop the roll. Boeing determined that unless the rudder was applied, within the first two seconds after lift off, the airplane became uncontrollable. If no correction was applied, three seconds after liftoff the airplane would be in a fifty-six degree bank.

We all got to practice outboard engine failures on takeoff in the simulator and learned to cope with them. This usually involved having the copilot make a last minute check of the outboard engines just prior to liftoff and calling out, "Coming up on unstick speed ... ready ... outboards checked ... now." If an outboard engine had failed, the copilot would announce it and pilot had to apply rudder as the airplane lifted off, before there was any apparent need for it. It was a very mechanical, by the numbers, response, but it worked.

After takeoff, power was left at 100 percent until the flaps were retracted. The flaps were started up before we reached the limiting speed for full flaps of 195 knots and the copilot brought them up in increments as the airspeed slowly in-

creased. During this time, the pilot merely tried to keep a positive rate of climb, which was often as low as two or three hundred feet per minute.

At night, or in weather, this also called for some very precise instrument flying because of attitude indicator precession. During flap retraction, the airplane was also accelerating. This caused the attitude indicator to precess, in the nose-up direction, at about six degrees per minute. For example, if the pilot initially established a six degree, nose-up pitch attitude on the attitude indicator, and held it, about a minute later the airplane would actually be level. A minute after that, the airplane would be descending even though the attitude indicator still showed six degrees nose-up. To avoid this trap, the pilot had to be very careful to crosscheck the rate of climb indicator and altimeter, and adjust the pitch attitude as necessary to keep the airplane climbing. Some publications recommended using the rate of climb indicator as the primary pitch instrument during flap retraction. After the flaps were up, the airplane was allowed to accelerate to 310 knots indicated airspeed (IAS).

As the airplane reached 310, power was reduced to 98% rpm for the climb and the B-47 began to move out. Even a heavy airplane, at 310, could maintain a climb rate of well over 1,000 feet per minute. If the airplane was light, we could just about peg-out the rate of climb indicator. After flying an instrument departure, we normally reached our initial level off altitude, about 25,000 feet, in less than 30 minutes from brake release.

Soon after takeoff, on most training missions, we would meet a tanker for in-flight refueling practice. We normally used a head-on rendezvous procedure which was accomplished by the B-47 navigator who could pick up the tanker's radar beacon on his scope at something over 100 miles. The two airplanes would fly directly toward each other, the tanker maintaining refueling altitude while the bomber descended to 1,000 feet below him. The B-47 navigator would offset the bomber's track and compute a range at which the tanker should begin a 180-degree turn to the refueling heading. On the navigator's command, the B-47 copilot would tell the tanker to turn. If things went right, and they usually did, the tanker would roll out of his turn about a mile ahead of the bomber. The B-47 pilot would fly a speed schedule, based on range calls from his navigator, until the airplanes were close enough together for him to complete the rendezvous visually. I have often gotten good range calls as close as 1/4 mile from the tanker and sometimes, going in and out of weather at night, I needed them.

Once in position behind the tanker, control of the B-47's fuel panel was transferred to the copilot who could open and close valves to determine which tanks would receive fuel. The copilot's challenge was to keep as many tanks open as possible, so we could get the fuel quickly, while keeping the B-47's center of

gravity within limits. After we hooked up and began taking fuel, the pilot's job was simply to hold position behind the tanker. This was not always easy.

The KC-97 and the KC-135 each presented problems during refueling, but they were different. With the KC-97, the problem was that he couldn't go as fast as we would like him to. We computed start and end refueling speed for all refuelings, but these speeds were almost always faster than the KC-97 could go – even with full power. Typically, we'd plan to make contact at about 225 or 230 knots IAS and increase to 245 or 250 as we took on fuel and became heavier. Unfortunately, it was not uncommon, while refueling with a KC-97, to glance down at the airspeed indicator and see it hovering around 210 or 215. Even though we lowered twenty percent flaps for KC-97 refuelings, the B-47 was very close to stall speed and holding position was very difficult. Sometimes impossible.

Once, during a heavyweight refueling with a KC-97 on a check ride, my tanker pilot made a ten degree banked turn to avoid some weather ahead of us. I rolled into the turn with him and the slightly increased load factor, due to the bank, was enough to put the B-47 into initial stall buffet. As we fell off the boom, my check pilot commented, "I figured that was going to happen. I was looking at the chart and he was only giving you about stall speed in level flight."

By refueling in a descent, the KC-97 could go faster and eliminate the low airspeed problem. Unfortunately we usually refueled on an instrument flight plan, with an assigned altitude, and could not descend.

Behind a KC-135, the B-47 sometimes became power limited and simply could not keep up. It was a helpless feeling to have 100 percent power on all six engines and slowly slide off the boom, but it happened. Surprisingly, this problem could often be solved by refueling at a slightly higher airspeed than the book called for. The extra speed would get the B-47's nose down a little, and decrease drag, so we had enough power to stay with the tanker.

Both tankers had "pilot director lights" to tell the receiver pilot where he was within the refueling envelope. Unfortunately, those on the KC-135 were designed for B-52 pilots and were too far forward to be seen from a B-47.

Both tankers also had a series of lights, under their wings and fuselages, which were used for night refuelings. These lights would not actually illuminate the bottom of the tanker, but they would show his general outline. I remember refueling with a KC-97 once when his forward fuselage lights were inoperative. The tanker pilot had told me the lights were out as we began the rendezvous so it was no surprise. However, as we moved into the refueling position, the tanker looked shorter than normal and that produced one of the strongest illusions I have ever experienced. As we closed in to make contact, it seemed as if the tanker and I rotated slowly into a vertical climb. We didn't, of course. I could check my instru-

ments and see we were level. But it felt, to me, as if we did the entire refueling going straight up.

There was one trick to night refueling which I learned in training and never used. I was having trouble staying on a KC-97 on a very dark night when my instructor pilot told me to turn on the landing lights. The landing lights, on the B-47, were on the bottom of the inboard engine nacelles. They did not retract and could be turned on at any airspeed. Since, while refueling with a KC-97, the B-47 was flying in a nose high attitude, when I flicked on the lights the bottom of the tanker was lit up like daylight. The rest of the refueling was easy. Because this procedure blinded the boom operator, it wasn't too popular with tanker crews, but I always considered it my ace-in-the-hole during night refuelings. If things got bad enough, I always thought, I'd turn on the landing lights. Things never got that bad.

After finishing with the tanker, we would climb back to altitude and head toward the entry point for a low-level navigation leg and bomb run. On the way, we did the post-refueling checklist, bomb equipment check and started using fuel from the auxiliary tanks. The copilot kept a fuel log during the flight and plotted actual fuel remaining against our predicted fuel consumption so we had a continuous how-goes-it graph. Fuel logs were turned in after the flight and graded, along with the navigator's charts, forms and camera magazines.

The low-level entry point was normally a radio station from which we would fly a published instrument letdown to low altitude. We had scheduled times at which to depart the station and begin our descent and we had to make these times good, plus or minus three minutes, or our entry into the low level route would be canceled. To make the entry times good, we normally included a "timing triangle" in our flight plan. This was simply a heading off course to a point from which we would go directly to the entry point. If we were late, we could turn toward the entry point early to make up time. If we arrived over the entry point early, we'd enter a holding pattern and adjust the length of it to make the entry time good.

Low-level navigation legs, which usually lasted an hour or hour and a half, were flown 500 feet above the ground during daylight, visual conditions or 1,000 feet at night or in weather. Our airspeed was normally 250 knots IAS except for a high-speed low-level mission that was flown by every B-47 crew once a year. During the high-speed low-level mission we flew at 350 knots IAS until we were thirty minutes from bomb release. Then we accelerated to 400 knots until we had five minutes to go when we accelerated to 425 knots for the bomb run.

Four hundred and twenty five knots was the B-47's maximum allowable indicated airspeed, although the airplane had enough power to go much faster; something over 500 according to Boeing. The restriction was imposed because the B-47's ailerons became ineffective at high speeds due to "aerodynamic elasticity."

As aileron control was applied, at high speeds, the B-47's long, thin wing would twist. This would reduce the airplane's roll response and, if the airspeed was high enough, could even reverse it.

This was not something that happened suddenly. As the airplane's airspeed increased, its rate of roll simply became slower and slower until there was no roll control using ailerons. For example, the airplane reached its maximum roll rate, of about 25 to 30 degrees per second, at 270 knots IAS. At 400 knots IAS, the roll rate was only about ten degrees per second and, at 425 knots IAS it was down to about five to six degrees per second. At about 440 knots IAS, there was no aileron control – full aileron control could be applied in both directions and the wings would stay level. Above 440 knots, the twisting wing would act like an aileron itself and produce a roll in the opposite direction. If right aileron were applied, above 440 knots, the airplane would roll left.

The B-47's rudder was effective at any speed and could be used to level the wings, if necessary. This meant the airplane could be controlled, even if the ailerons were ineffective, up to about 460 knots IAS. However, one article I remember reading said we could cause "... structural damage by large and rapid rudder deflections above 280 knots IAS." I never felt very comfortable in the B-47 much above 400 knots IAS.

During the low-level navigation leg, the navigator had to keep the airplane within a prescribed corridor along the track. An onboard camera took pictures of his radarscope at regular intervals and these scope photos were later used to reconstruct and score the mission. The pilot and copilot could help with the navigational chores by map reading, but that was pretty difficult at night or in weather. We could also help by plotting bearings, and distances, from radio stations along the route, if there were any, and trying to visually identify the initial point for the bomb run. Often that was impossible because the initial point was just a set of coordinates in the middle of no place and there was nothing to be seen. At these times, the navigator was pretty much on his own.

As we turned over the initial point and headed for the target, the copilot would make radio contact with the radar bomb-scoring (RBS) site that would score the run. The RBS site would pick us up on their radar, several minutes before bomb release, and check to make sure we were within the prescribed corridor. If the bomber was too far off course, they would abort the bomb run and the crew would have to explain why that happened when they got home. The RBS sites also had height-finding radar, which they used to monitor our altitude during the run. Altitude deviations could also result in an aborted run and no score to bring home.

Shortly after identifying the bomber, the RBS site would lock on to it with their radar. The B-47 copilot could detect the lock-on and, when he did, activate

some electronic counter measures (ECM) equipment. These ECM runs, which often continued until just before the release point, were also scored items.

When the bomber was close enough to the target for the navigator to go to his final aiming point, (usually about four minutes before release) the navigator would activate the Pilot's Data Indicator (PDI). The PDI was a gage, on the pilot's instrument panel, which showed the time remaining until bomb release, in seconds, and the direction to turn to get to the drop point. When the PDI was centered, turn control of the autopilot could be transferred to the navigator, or the pilot could just keep the PDI centered himself if he was flying the airplane manually.

At a precomputed number of seconds before release, the pilot would advance power and begin a maximum performance climb to the final bombing altitude. This altitude would vary depending on the type of bomb run we were making. During a "Short Look" run, the altitude was normally about 3,000 feet above our low level cruising altitude. During a "Long Look" run, the altitude was normally about 18,000 feet above our low level cruising altitude. In either case, the bomber had to be level, at the bombing altitude, before release to allow the bombing system to stabilize. However, the airplane could not level off too early or the RBS site would abort the run. We could only be level for thirty seconds before a Short Look release or three minutes for a Long Look. This made it necessary for the pilot to monitor the time to go, and compare it to the airplane's rate of climb, to make sure the maneuver was going to be completed properly. If the navigator moved his aiming point during the climb, and they sometimes did, the time to go would change and things could get very busy.

Twenty seconds before bombs away, the navigator would turn on a radio tone and an automatic pen in the RBS site would begin tracing our track on their radarscope. At bombs away, the tone cut off and the pen lifted, precisely marking our position at release. By computing the ballistics of the bomb we would have dropped, and plotting them from our release point, the RBS site could score our run down to a few feet.

Naturally, a tone that stayed on too long would result in a bad score so we were very careful to make sure the tone cut off on schedule. Both the pilot and navigator would call bombs away and the navigator would manually cut off the tone. Additionally, some pilots had their copilots switch the radio to a different frequency, and then back, to be sure the tone stopped.

Sometimes, after a low-level bomb run, we would stay at low altitude and fly a racetrack pattern back to the initial point for another run at the same target. Usually though, we just made one run and flew an instrument departure to get back to altitude. During the departure, we would get our scores from the RBS site and reestablish contact with air traffic control.

Back at altitude, we were normally scheduled for a couple of high-level bomb runs, sometimes against the same site we had just hit at low level. These runs were much less hectic for the navigator since he had much more radar range at high altitude and could "see" the target from much further away. After the high altitude bombing, we usually started a celestial navigation leg and the pilot could relax while the copilot and navigator continued to work pretty hard.

Celestial navigation legs were usually about three hours long and were flown on autopilot to provide a stable platform from which to shoot the stars. The pilot monitored the airplane's position, using radio navigational aids, and made all the position reports to air traffic control. The copilot and navigator worked together to do the celestial navigation.

The copilot and navigator would compute the information for each fix separately and compare their results before each shot. The copilot normally handled the sextant work, although the navigator did have a sextant mount at his position and could shoot fixes if he wanted to. I think there was a requirement that the navigator shoot at least one fix a year.

The copilot's periscopic sextant mount was in the canopy just forward of his seat. If the star to be shot was in front of the airplane, the sextant was in a very convenient position. However, to get good, three-star fixes, which we normally used, the stars would be ahead, to either side and even behind the airplane. This made things a little more difficult since the copilot had to turn sideways, or backwards to shoot the stars. To do that, the copilot had to stow his control column, unstrap from his ejection seat and, unless he was really small, take off his parachute during celestial navigation legs.

Usually, identifying the correct star to shoot was easy. We would simply set the precomputed azimuth and elevation of the star in the sextant, look, and there it would be. But sometimes weather could make things a little more difficult. Going in and out of cirrus clouds we could not always see the stars we wanted to when we wanted to see them. Sometimes we couldn't see anything. I remember one celestial leg during which we missed several shots due to weather. Finally the navigator said, 'Just shoot any star you can and tell me when you shot it.' Because of times like these, B-47 copilots really did need to know the stars and most of us also carried a chart that showed navigational stars.

If the celestial leg was flown in the daytime, we could only shoot the sun. Very easy to find and shoot, but it did not result in very accurate navigation. At dawn, or dusk, we could sometimes come up with some interesting combinations. I remember shooting a fix using the sun, the moon and Venus all at the same time.

Once the shot was complete, the copilot would pass the information to the navigator who would then plot the fix on his chart. Good copilots would also plot

the fix, on an E6-B computer, so they could compare their fix with the navigator's. Not all B-47 copilots plotted celestial fixes, but many of the better ones did. When the celestial navigation leg was finished, it was time to bring the airplane home.

We usually planned our missions to arrive over home station with about 20,000 pounds of fuel remaining. The absolute minimum was 12,000 pounds, as I recall. Before radar vectored enroute descents became available, we normally descended to traffic pattern altitude by doing a "jet penetration." This procedure, unique to the military as far as I know, was simply a diving teardrop turn done from a navigational radio fix, such as a VOR station or low-frequency radio beacon.

We would approach the penetration fix at about 20,000 feet above the ground with the landing gear down. Over the fix, we would reduce the power to idle on all six engines and pitch the nose down to maintain a rate of descent of at least 4,000 feet per minute, not to exceed 290 knots IAS. As the descent began, the rate of climb indicator was the primary pitch instrument. However, since it only went to 6,000 feet per minute, once we reached 290 knots IAS, the airspeed indicator became the primary pitch instrument. The rate of climb indicator was normally pegged-out during a jet penetration.

As we began the descent, we would also begin tracking outbound from the station on a published bearing. Half way between the initial and final penetration altitudes, we would begin a turn back toward the station. For example, if we began the penetration at 20,000 feet, and we were going to level off at 2,000 feet, we had 18,000 feet to lose. Half of that would be 9,000 feet. So, as we reached 11,000 feet, 9,000 feet below the initial altitude, we would start the turn using thirty degrees of bank. We would adjust the inbound heading to intercept a published bearing to the station. At minimum penetration altitude, we would level off, slow the airplane down, extend the wing flaps and complete the Before Landing checklist. As we crossed the fix inbound at the final penetration altitude, we would transition to an instrument approach. This was normally a Ground Controlled Approach (GCA), during which a radar controller, on the ground, gave us headings and altitudes to fly and talked us down the final approach. While the B-47 had the equipment to do an Instrument Landing System (ILS) approach, very few Air Force bases were equipped with ILS while I was in the B-47.

Before landing, we would compute a Best Flare Speed (BFS) based on the airplane's gross weight. This was the speed at which we would start the landing flare, although there really wasn't much of a flare before landing in the B-47 because of its bicycle landing gear. BFS was normally about 1.1 times the airplane's stall speed in the landing configuration. (This was considerably slower than the 1.3 times stall speed normally maintained on final approach in airplanes today.) At 110,000 pounds, for example, a B-47 would stall at 120 knots and BFS was 134.

On downwind leg, we would maintain BFS+30 knots, or 164 knots for a 110,000-pound airplane. If we were going to use it, we would also deploy the approach chute on downwind leg. This was a sixteen foot, ring-slot chute installed in the aft left side of the fuselage near the tail. It was deployed electrically by a two-position switch on the left side of the pilot's and copilot's instrument panels.

The approach chute was different than the brake chute. The brake chute was a thirty-two foot, ribbon-type chute installed in the bottom of the fuselage near the tail. It was used only on the ground and was deployed manually by handles on the right side of the pilot's and copilot's positions. We were very careful not to get the two chutes mixed up. When I wanted the approach chute deployed, I would normally say, "With your left hand, give me the approach chute."

With the approach cute deployed, the airplane's drag was increased. This allowed us to carry more power to hold the same airspeed. The higher power setting kept the engine rpm up so we could adjust the rate of descent more quickly and could also advance power in a hurry if we needed to. The approach chute also decreased the airplane's tendency to "float" during landing. When you pulled the power to idle, with the approach chute deployed, the airplane touched down immediately.

On base leg, we would slow to BFS+20 knots and slow further to BFS+15 knots as we turned on final approach. We did not fly a "stabilized final approach," as is normally recommended now. During a stabilized final approach, the airspeed is held constant from the beginning of the final approach until the landing flare. As we descended on final approach in the B-47, we would continue to slowly reduce the airspeed so we arrived over the end of the runway at BFS, plus any correction necessary for wind gusts. We normally added two-thirds of the amount the wind was gusting over the constant wind, up to a maximum of fifteen knots. For example, if the winds were reported as twenty knots with gusts to thirty-two, the gust velocity was twelve knots. Two-thirds of that would be eight, so we would try to arrive over the runway at BFS+8 knots.

Landing the B-47 was not difficult but did pose a couple of problems. The first was visibility. From the front seat, the pilot had an excellent view of the runway, but he could see very little of the airplane itself. That made it a little tricky to accurately judge the airplane's pitch attitude visually. It could be done, but it took a little practice. From the back seat, there was no visibility straight ahead. To land from the back seat, the pilot had to depend on glimpses of the runway off to each side, which were only available when the airplane was very close to the ground. When flying a visual traffic pattern from the back seat, it was common to fly an angled final approach to the runway so the pilot could keep the runway in sight.

Another problem was caused by the B-47's bicycle landing gear. With this type of landing gear, we wanted to touch down with both main landing gear at the same time, or, slightly aft main first. This meant there was a very narrow pitch attitude envelope for landing. If the pitch attitude was too nose-low, the forward main gear would touch first and the airplane would begin "porpoising." This was simply a series of bounces that would become more violent unless the pilot did something to stop them. Trying to correct with elevator inputs usually made things worse because the pilot would get out of phase with the bounces. About the best thing to do was deploy the brake chute and let the airplane plop down on the runway.

If the pitch attitude was too nose-high, the aft main gear would touch first and slam the forward main gear down onto the runway. The airplane would bounce back into the air, in a tail-high attitude, and could begin porpoising. Again, the brake chute would stop it. Nose-high pitch attitudes also increased the possibility of dragging a wingtip, or outboard engine, on the ground since, with a swept wing, when the nose went up, the wingtip went down.

Once on the runway, we would deploy the brake chute, keep the airplane straight with the landing gear steering system and apply wheel brakes as necessary. As we neared the end of the runway, we would normally advance power on the inboard engines, 3 and 4, to keep the chutes inflated. At the end of the runway, we would turn off and then turn about forty-five degrees on the taxiway to point our tail toward the grass while we jettisoned the chutes. With the chutes gone, we would taxi in, park and shutdown the airplane. A typical mission lasted between six and eight hours.

After the airplane was secured, we would take the airplane's maintenance forms and all our charts and logs to a formal debriefing. At the debriefing, we met with maintenance and operations specialists and discussed the entire mission; what went right and what went wrong. We would also write up any airplane problems we had and answer any questions about them. The debriefings normally lasted about an hour. Finally, we'd turn in all the paperwork and go home.

While I never felt that flying the B-47 was really fun, I did find that completing a mission, and accomplishing everything we'd set out to do, was one of the most satisfying flying experienced I ever had. I flew other airplanes, before and after the B-47, but there was nothing quite like the Stratojet.

The Man in the Burning Bomber

By John Hubbell

In the freezing midnight skies of North Texas and Oklahoma on April 28th, 1957 1st Lt. James E. Obenauf, a twenty-three year-old (SAC) copilot from Grayslake, Illinois faced an agonizing decision. Should he save his own life or try – alone and against all odds – to wrestle with a flaming B-47 jet bomber for 400 miles and try to save the life of an injured crewmate?

Jim Obenauf took the job, and then for two hours and ten minutes proceeded to carry out one of the most amazing rescue feats in Air Force history.

Jet bomber 2278, carrying four men, had left Dyess Air Force Base, Abilene, Texas at 7:55 p.m. and climbed to 34,000 feet. The mission: to practice celestial navigation and evaluate the bombing technique of the navigator, Lt. John P. Cobb, over Amarillo, Texas and Denver, Colorado.

In his seat in the nose of the B-47 Cobb worked with methodical precision. From a folding chair behind Cobb's left shoulder, Major Joseph B. Maxwell, a senior navigator, observed and graded Cobb's performance. At 10:05 p.m. Cobb had finished the simulated strike on Amarillo and had just given the pilot a heading for Denver, when a series of rumbling, metallic explosions shuddered through the plane.

Up in the cockpit the airplane commander, Major James M. Graves, saw fire flickering beneath his left wing, close to the fuselage. The engine must have exploded from oil starvation, he figured. At any second, it would begin flinging its turbine blades like sharp, hot bullets into the fuselage fuel tanks. Certain that they were riding a 200-ton burning bomb he had to get his crew out – *now!*

"Bail out! Bail out!" he ordered. Cobb swiveled his ejection seat and saw Joe Maxwell pulling on his parachute, which he had removed to get close enough to watch Cobb's work. Reaching to the deck, Cobb pulled a steel column with a D-ring handle up between his knees, braced himself and yanked at the D-ring. A 37mm ejection seat charge fired him downward safely out of the bomber.

In that same instant, frigid wind blasted through the open hatch, ripped off Maxwell's oxygen mask, tore off his parachute and knocked him sprawling to the end of the narrow catwalk along the left side of the bomber. As he lay there unconscious, the wind drove loose debris along the catwalk until it nearly covered him.

Meanwhile, Obenauf blew off the long canopy, which covered both cockpits. Then pilot Jim Graves tightened his harness and squeezed his ejection trigger. Nothing happened. Again and again Graves pumped at the trigger. The seat would not blow.

No time to fool with it. The two navigators and his copilot were gone by now, he assumed. He had to get out. He ripped his seat harness loose, broke his oxygen connection and struggled down a narrow ladder to the catwalk, which lead to the navigator's hatch. Suddenly he began feeling the effects of anoxia – oxygen starvation: his brain went hazy; his vision blurred. Then he looked back along the catwalk and saw Jim Obenauf climbing down from his cockpit in the rear.

Graves knew he was passing out and he wanted to get out of Obenauf's way, so he groped along the dark catwalk and dived through the open hatch. A second later Graves was hanging safely in his chute.

Jim Obenauf had gone through the same bailout procedure and had met the same trouble: his ejection seat would not fire. He had unhooked his oxygen and climbed down the ladder. As he turned to go forward, Obenauf saw something in the rubbish that looked like a leg. He kicked the debris away and went numb with horror at the sight – Joe Maxwell lying unconscious with no oxygen, no parachute. One thing seemed certain: within five minutes Maxwell would be dead, either from lack of oxygen or from the effects of a mid-air explosion or crash.

Obenauf crawled along the almost pitch-black catwalk, feeling for Maxwell's parachute. He *had* to find it, get Joe into it and throw him out of the plane, *quickly!* Then the cold, opaque fog of anoxia began wrapping itself around him. He grew weak. It was no use. He stood up, peered at Maxwell. He knew no pilot would blame him for leaving now. There wasn't a chance of saving Maxwell; no sense in both of them dying.

Suddenly Obenauf knew what he had to do: on sheer strength of will he crawled back into his cockpit. *I can't leave old Max up here!*

He threw himself into the seat, hoping to God it wouldn't eject. He hooked his mask to the oxygen supply system, and looked out. His right wing was now bathed in sparks and sheets of white flame. The right outboard engine had exploded, not the left inboard as they had thought.

Obenauf knocked the airplane off autopilot. He had to get down to low altitude in a hurry. Maxwell's only chance was to breathe the oxygen in a denser atmosphere. Obenauf grabbed his steering column. It was locked, and there is no way to free it once the ejection procedure has been started. It takes a sixty pound pull to move the locked column. But Obenauf made it move.

He peeled the B-47 into a screaming dive. He knew he was making the plane approach its structural limitations, and that it might fall apart. But Joe Maxwell was dying.

It was about thirty-two degrees below zero at 34,000 feet, where Obenauf started his dive, and with the cockpit canopy gone, the shrieking 400-knot wind cut deeply into his face. It peeled back his eyelids, would not let him blink, dried

out his eyes and made them burn until he thought he could stand it no longer. But still he kept diving.

He cut the fuel flow to the crippled engine. At 5500 feet he leveled the bomber off and switched his radio to Guard Channel, the emergency channel monitored by all ground stations and all aircraft. "This is Air Force jet 2278," he reported. *"Mayday! Mayday! Mayday!"* Instantly, Altus Air Force Base, Altus Oklahoma, 200 miles away, put a direction finder on Obenauf's voice and gave him a compass heading that would steer him there.

Obenauf's plane had recently been to Guam, where sand had collected inside it. Now this sand, whipping through the open cockpit, stung his eyes so he could hardly read his instruments. But he knew where the headings were on his compass. Somehow he managed to turn the plane until the compass needle was approximately right. Next Obenauf found a speed where the windblast was less painful: 200 knots. It wasn't good, but he could stand it.

The flames seemed to have died away, but bursts of white sparks still streamed from the engine. He heard the radio voice pleading with him to land at Altus. "Negative!" Obenauf shot back. He was not going to try landing on an unfamiliar field. "I'm going to Dyess! Give me a heading."

Mile by mile, Jim Obenauf fought his crippled bomber toward Abilene. A Ground Controlled Intercept station of the Air Defense Command picked him up on it's radar and guided him on.

When he got near Dyess, visibility was a satisfactory five miles, but with that searing wind, visibility didn't mean much to Obie. He could not, however, get down without landing lights – and the switch panel was on the pilot's control panel in the other cockpit!

Suddenly, Obenauf felt something grab his leg and shake it. He looked down. Maxwell, too weak to talk, was on his feet. As a navigator Maxwell wouldn't know much about the pilot's control panel. But Obie needed those lights. Through the interphone he shouted instructions to Maxwell, who staggered forward and pulled himself up the ladder into the pilot's cockpit. The effort was so exhausting that he slumped across the deck, struggling for breath. Except for a few dim glows on the control panel, the cockpit was black as night. He could not find the right switch. He did not dare experiment. Slowly, he made his way back to Obenauf and shook his head helplessly. Obenauf shouted that he *must* have landing lights.

Again, Maxwell made his way into the pilot's cockpit. He lay there in the dark, hoping his eyes would get used to it. But after what seemed like a long time, he gave up. He climbed down to the catwalk, could go no farther and had to lie down.

Obenauf swore loudly, hoping to shock Maxwell to his feet. Finally the navigator got up. Obie remembered a flashlight in his flying suit, handed it to him and shouted the instructions once more. Maxwell went forward, found the switch – and the landing lights went on.

A GCA operator in a van near the end of the Dyess runway picked Obenauf up on his radar and began talking. Now, all Obie had to do was watch his compass, listen and follow directions. But his compass was a dull blur, and his hands, numb to the elbows now, responded sluggishly. He drifted two degrees off course to the right, then to the left, trying with all his strength to hold the failing bomber where GCA said.

Major Doyle Reynolds, chief of flying training at Dyess sat in a cold sweat in the Dyess tower watching Obenauf come in. "You're doing fine, Obie," Reynolds said calmly. Obenauf sighed with relief at the sound of Reynolds' voice. If anyone could get him down it would be Reynolds. He had once been Obie's instructor and was one of SAC's best.

"Give me your fuel panel configuration," Reynolds said. If he knew what fuel tanks Obie had been using, he could figure out where the bomber's CG was; if it had shifted too far back Obie might crash.

I can hardly read it, "Obenauf said. "I think I'm going blind."

He managed to give Reynolds the readings, then started easing the plane down, like walking down the stairs in the dark. He brought it down a little, leveled it off, and then inched it down a little more. Then suddenly he was too high and much too far to the right. And he was too close to the field to make a major correction.

"Go around! Go around!" barked GCA. But Obie kept on coming. He did not have enough life left to try again. He was going down now, to live or die.

There were thirty B-47s tied down beside the runway. Obie was headed straight for them.

"It would be better if you could move to the left a little," said Doyle Reynolds calmly. Obie leaned heavily on the control column. The big plane responded. He saw the glow of the lights along both sides of the runway, steered the bomber between them and flew it to the ground.

It was the best landing Obie ever made. He chopped his power, hit the lever that dropped a parachute brake and worked the foot brakes. The bomber rolled to a stop in front of racing fire engines, an ambulance and staff cars.

Joe Maxwell worked feebly at the hatch below. Obie jumped down from his cockpit, ripped the hatch open and dropped to the ground. A minute later, he was stone-blind. Behind him Maxwell staggered down the ladder into the arms of ambulance attendants.

Obie's vision returned after a few hours' rest. By next day he and Maxwell were able to leave the hospital. They were driven to the Dyess Base Theater, where 800 Air Force men and their families had gathered. Among them was General Thomas S. Power, commander of SAC, who had flown down from his Omaha base listening in on the tense radio interchange between Obie and the men at Dyess.

"Obenauf, in German, means topmost – the best," said General Power. "He's certainly tops in my book, and as long as SAC has men like Lieutenant Obenauf manning its aircraft it will sustain it's deterrent posture." Then he pinned the Distinguished Flying Cross (DFC) on Jim Obenauf's chest.

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B-47 Vignettes

By Colonel Walter J. Boyne, USAF (Ret)

As a long time fan of the B-47, I have only happy memories of the airplane, especially since I managed to survive some goofy errors in the airplane. With the reader's indulgence, I'll just string together some memories of those days.

I was a low-time pilot, only two years out of flying school, when the B-47 was introduced at Castle Air Force Base. As we took the B-50Ds back to Davis Monthan for storage, I found myself without the prospect of a crewmembers job. Filled with the indignation that only a new 1st Lieutenant can muster, I went into the 330th BS's Orderly Room, walked up to the Adjutant's desk and demanded that I be sent to Wichita for crew training. To my amazement, I was, and what a place it was – hotter than hell, windswept, and covered with scads of B-47Bs.

We had a variety of first-rate instructors, and I was told that on my dollar ride, not to be surprised if all six of the fire-warning lights came on during takeoff. Well, they did, and I was still surprised and scared, but they flickered out, and I had my first experience at the combination of wonderful climb and wonderful cooling that a B-47 had.

I was crewed up with Hal McCarty and John Rosene, both terrific guys, and preceded to make virtually every mistake a copilot was entitled to, and some that he was not. On one Unit Simulated Combat Mission, we were carrying a unit. The mission was designed to really test the range capability of the aircraft, with in-flight refuelings scheduled at long intervals. Well on the climb-out, the bomb-bay doors didn't indicate that they were closed. The extra drag of even a slightly open bomb bay would have ruined the mission, so I volunteered to go down and check

it out visually. We leveled off at about 25,000 feet; I unhooked from the parachute, grabbed a walk-around bottle and went down the crawl-way back to where I could see the bomb-bay doors.

What I didn't know was that while a walk-around bottle had (as I recall, the number could be wrong) about an eight-minute supply of oxygen, this was only good if you were sitting down. The activity of crawling down the ladder, etc. made me use it up at a much faster rate – and I passed out. Fortunately McCarty could see my legs, and when they stopped moving, he began an immediate descent. I came to at about 10,000 feet, I guess, climbed back and we flew around a bit to get down to a landing weight and came in. Naturally I was called up to Headquarters for an interview with Colonel Pat Fleming, who I believe was Deputy for Ops at the time. The former Navy ace listened to my story, asked how I was, and that was it – no repercussions.

My next misadventure came about six months later on another UCM, but this time on the way back. We were very short of fuel, and back over the fix at Castle went through the usual checks and lowered the drag gear for the descent. Except the gear didn't lower. Mac let down slowly until we got to about 18,000 feet, and I again got out of the seat, and went to the manual gear set-up, six large levers in a row as I recall. Anyway, I ratcheted the gear down and locked, and while we were of course pressurized, the activity really tired me. As I started to get back into the seat, my parachute activated the left handle of the ejection seat. There was a hell of bang as the first part of the sequence operated – which included depressurization. I was half-crouched over the seat, not sure of what happened, but praying that the second handle wouldn't activate, for if it did, the seat would have cut my body in half as it blew. Fortunately it did not activate, I put the safety pins in the seat, and we landed without further incident.

Like everyone else, I eventually grew more proficient in the airplane, especially in my second tour in it at Kirtland Air Force Base with the 4925th Nuclear Test Group. There was the finest bunch of fliers in the world, all B-47 experts for they had been instructors for many years at Wichita. The mission was superb – lots of low level missions, dropping various shapes from altitude over the Salton Sea, but short missions and no-alerts. It was great.

And to close on a note that shows me in a less cluck-like light, I can recall flying with another pilot at Kirtland who had just checked out in the B-47 and was on his first night mission as an aircraft commander. I was not an IP but they felt I was experienced enough to go along sort of as a back up for him. He did pretty well, but on one of his landings he hit nose wheel first and bounced hard, beginning what was called a porpoise. With the B-47, you know, there is a certain spot in the bounce where, if you time it just right, you can deploy the brake chute and turn

the next bounce into a smooth landing. Well my timing was right, I popped the chute and we touched down. Few things gave me greater satisfaction than that single simple instance; for it told me that I was comfortable in the airplane and pretty much knew what to do.

I have a million memories of the B-47, all of them good, from seeing the dawn break on a twenty-four hour mission, to the relief of touching down gently when there was a test-missile shape hung-up in the bomb-bay, to just looking out that canopy at a beautiful bright world and realizing that if you saw any other contrails, it was almost certainly another B-47. Great days, indeed.

A Matter of Survival

By Lt. Colonel Edward W. Jedrziewski, USAF (Ret)

A lot of material has been written about the B-47. Most of it emphasizes the advances in technology the airplane represented and that it ushered in the age of multi-engine jet aircraft. It was a graceful aircraft in the air, and many of us remember the days when everything above 20,000 feet belonged to the jet fighters and us. However, there was another side of the B-47 that a lot of people would like to forget. It could kill you.

I recall that when Charlie Brown first advertised to form the B-47 Association, and was looking for people "who loved the B-47", I emailed him that I was willing to join and help him, but that I did not love the B-47. I considered it an adversary that would have killed me if I had given it a chance. I had treated it with respect and was always on the lookout for new ways to be done in. Charlie responded and allowed that he had heard this from more than one person.

This doesn't mean that I went around looking for disaster. I always operated under the philosophy that if I were ever going to get killed in an airplane, it would come as a surprise to me because I would fly in a professional and common sense manner. However, if you had an airplane with a lot of hazard potential, you had to treat all situations much as you would when you watched where you stepped in rattlesnake country. There were times when you could relax as long as it was at the right time and not for long.

When you get down to basics, longevity in flying is a matter of stacking the odds in your favor and having viable options when any situation develops into a hazardous condition. It is only when you run out of options, or don't recognize the ones you have, that disaster strikes.

It seems that a lot of years need to pass before pilots will talk about personal experiences that were life threatening. There apparently is a mind- set among aviators that to discuss hazardous experiences in detail somehow may reveal a weakness or shortcoming in skills. It could also be that, to survive in a hazardous occupation, it is better to almost instantaneously put near tragedies behind us and move on to more positive things. I know that I have done this on many occasions.

I recall an episode in F-86 training where number four nearly collided with the belly of my airplane during a spread formation tactical turn. The other pilot and I didn't even talk about it after we got on the ground. Whatever communication was necessary occurred during the instant when you could feel the airflow burble between the two airplanes. I'm sure it looked a lot scarier to him than it felt to me as his canopy nearly touched my belly.

Like good politicians, many pilots will deny that they ever did anything stupid or came close to disaster. However, it serves a purpose to record these experiences for history; and it certainly does no harm after nearly forty years.

My perspective of the B-47 is a bit different from the usual. When I started flying school in 1957, I had a B.S. and M.S. in Aeronautical Engineering and had worked as an engineer at Wright-Patterson for a couple of years. Airplanes were not a mystery to me, and I knew a bit about the human shortcomings of those who designed them. In fact, I had been involved in a project that tried to get the B-47 to tolerate flying at 425 knots indicated airspeed with the drop tanks on. The project was not successful because the tank pylons would develop cracks after only a few hours of flight. At the time, I didn't realize how hard the test pilots were working when we asked them to fly at 425 indicated for five hours.

Another project I was involved in was to evaluate a "deflector diffuser" to use airflow to keep rain off the windscreen, thus eliminating the need for a mechanical wiper. The device worked reasonably well in flight, but was worthless on the ground because you had essentially no airflow. It was abandoned as an interesting theory but lacking in practicality. In other words, if you needed a mechanical wiper anyway, why have another device that only worked part of the time.

When I came to Wichita for B-47 copilot training in early 1959, I had completed the F-86F school at Williams after getting my wings. The unrestrained freedom of flying the F-86, which was pretty much indestructible unless you flew it into the ground, made the limitations of the B-47 painfully apparent.

When I started B-47 training, the ill-conceived LABS maneuver and its associated structural failures were a thing of the past. This didn't disappoint us young frustrated fighter pilots, who had already done it in the F-86 and recognized the folly of such a maneuver in a slow responding big airplane. In fact, I don't recall anyone lamenting the demise of LABS as a delivery method in the B-47, although many found it something interesting to talk about.

In 1959, the fire warning lights had already been deactivated in the B-47 when it became clear that more airplanes had been lost because of false warnings than from real engine fires, which were rare. All the other functions of the buttons worked; but they just didn't light up.

Another operational change had been made because of experience. As I recall, best climb speed was around 380 knots indicated air speed. However, this was commonly exceeded during short times of inattention, so the climb speed was arbitrarily reduced to 310 knots indicated. This resulted in fewer cases of the airplane becoming uncontrollable because of exceeding maximum allowable airspeed or Mach.

At McConnell, I recall that we didn't lose a single B-47 or even have a serious incident. You could attribute this to the experience level of the instructor pilots, but crews flying without instructors also had a perfect record. I believe the reason for this was that we didn't operate the airplane in the same way that combat wings did. The training aircraft did not have drop tanks, tail guns, and ECM gear; and heavyweight operation did not exist. Someone may be able to refresh my memory, but I don't recall using water injection at McConnell.

When our crew got to the 98th Wing at Lincoln in mid-1959, things changed. We learned that heavyweight takeoffs were not only common, but were encouraged because of the Management Control System scoring methods. In other words, you got points for a heavyweight takeoff even though it took no more skill than any takeoff. It just took more runway. Also, it hung your butt out because an engine loss at high gross weight was more of a hazard than losing an engine at a lighter weight. You haven't really lived until, on a hot summer day, you have watched almost 10,000 feet of runway pass behind you by the time you got to takeoff speed.

Takeoff in a B-47 was a case of limited options. Before reaching decision speed, or whatever it was called at various times, you had the option of stopping or continuing. After decision speed, when you had no choice but to continue even if you lost an engine, you were in a highly vulnerable situation until you got to an altitude and airspeed where aircraft controllability was assured and the navigator and fourth man could bail out.

First let me say that I have never lost an engine on takeoff, either as a copilot or after I upgraded to aircraft commander. In fact, and possibly because of eternal vigilance, I never had an in-flight emergency in a B-47. Also, I recall having only two engine malfunctions, both of which were fuel control failures that reduced RPM to idle while in flight. Each of these occurred on an inboard engine and was detected from the RPM gages. Fortunately, my observations about engine failure come from others having problems, which is why I am here to write this story.

Losing an outboard during or immediately after takeoff was a problem because of directional control. I haven't seen design data, but I believe the outboards were located where they were in order to dampen the flutter that you could get with a highly flexible wing. Dampening flutter with weight is a common design practice, and a heavy engine is an ideal weight.

The problem arises when you get an outboard failure during a heavyweight takeoff. You need a whole lot of rudder input immediately and you can't afford to reduce thrust on the other outboard. In this situation, you didn't get a second chance; and more than one crew was lost because of it.

I recall that Boeing had installed some type of automated yaw control in the airplane, but it was deactivated because it caused more problems than it cured. This practice of deactivating troubling systems became a common approach to problem solving, especially when the airplane was slowly removed from inventory as the B-52 and B-58 came into the force. In the early 1960s, the same thing was done to the wing deicing system when some tubing failures started to appear.

I believe that rapid engine starting during alert responses contributed to engine failures. There seemed to develop a contest as to who could start all six the quickest, and high tail pipe temperatures were common, especially when the Nebraska winds were blowing up the tailpipe. At this time, little was understood about "engine cycles" and their affect on turbine wheel and blade life. There were tragic cases of turbine wheel failure in flight, with the loss of part of the wing occurring when the engine disintegrated.

Improper use of water injection could devastate the engines. Water injection was to be used only after the engines had stabilized at 100% rpm. However, water injection could be activated if the throttle levers were full forward but the engines had not yet reached 100%. Once, on a rolling takeoff, instead of looking at the rpm gages, one aircraft commander took it on faith that the engines actually had to be at 100% before the system would activate, turned it on, ruined the turbine blades on all six engines, and had to abort. After this episode, the pilots faithfully checked the gages and took their time in activating water injection.

We lost a few airplanes because of strictly following emergency procedures or standardization practices. Before I got to Lincoln, there was a case where a B-47 became uncontrollable because all engines were shut down on one side because the crew thought they had a wing fire; when all they had was the airflow condensing over the wing because of the right combination of temperature and humidity. This didn't occur with anyone else because the crews were briefed to recognize what they had, and not react unnecessarily.

Standardization procedures ruled that the landing lights were to remain on until the aircraft reached 500 feet of altitude after takeoff so that the pilot would

not become distracted when he reached for the switch. There was an accident where this was strictly followed in a snowstorm, complicated by the fact that the landing gear locks had been left in. This distracted the crew after breaking ground, control of the airplane was lost, and it crashed with the lights still on. I personally turned off the lights before entering any clouds after takeoff; unless, of course, a standardization IP was aboard.

Center of gravity management in the B-47 was critical. Shortly after I got to Lincoln, an airplane from the 307th crashed on takeoff because the front auxiliary fuel tank was empty, resulting in a severe aft cg. After this, all crews visually checked all tanks instead of relying on the ground crew.

I once encountered an aft cg after refueling from the back seat at night while the squadron commander occupied the front seat. Apparently, my elbow must have inadvertently turned off a switch to a fuel tank while I was contorting to the right to see around the front seat headrest. When I got off the tanker and checked the gages and trim, I found that I had nearly full down elevator trim and the rear main tank had a lot more fuel than the front main. Luck was with me this time, but I wonder how many similar incidents there were that resulted in the crew not being around to tell about it.

Landing a B-47 was not graceful but it was not difficult. I can recall only one landing where everything worked so well that you could not feel when the airplane actually made contact with the runway. This must be as rare as a hole-in-one for an average golfer or a double in grouse hunting.

The tandem gear sometimes caused a problem if the nose wheels touched down first, especially if the nose gear made a strong contact. This could be caused by flaring late. The airplane would pitch up and you had to start the landing all over again. Depending on how much airspeed you had, and how smooth you were with pitch changes, you could get a smooth landing or one that approached disaster. This happened to me only once, when the copilot was making the landing from the rear seat. He didn't flare at all and we rose quite high and really had a firm landing after I took over and did the whole thing over again.

Sometimes a perfectly set up landing turned to crap. This happened one time to an aircraft commander I flew with and it happened once to me. During flare, the airplane seemed to get a mind of its own, possibly from a very soft nose gear contact or wind shear, and climbed instead of bleeding off airspeed and touching down. Those of you who haven't experienced it will automatically conclude that too much airspeed was carried, but I know different.

You then find yourself at idle power, slowly increasing altitude, and in need of an instantaneous decision. Do I add power and try to go around? This is a bad choice because the airplane is going to be back on the runway in some manner

before the engines respond. If you lower the nose too quickly, you can get into a porpoise that can lead to disaster. I did what the Aircraft Commander before me did. I gently lowered the nose and when the airplane became horizontal with the ground, I pulled the drag chute.

To put it mildly, touchdown was firm and maybe an alternator dropped off line, but we taxied in and walked away from the airplane. I still don't know for certain what causes this sort of thing. It may be a nose gear contact or it may have something to do with wind shear; or possibly ground effect, which is the way wing downwash behaves near the ground.

I knew of one aircraft commander who took himself off flying status after this happened to him. I can still get a mild case of the puckers when I think of this incident in detail. Now that more than thirty-five years have elapsed, I have gotten other aircraft commanders to admit to the same thing. At the time, they would not talk about it because they felt it reflected poorly on their abilities as pilots.

There were at least two cases at the UK reflex bases where pilots tried to fly out of nose-gear-first contact or the second situation that I described and literally destroyed the airplane as it porpoised down the runway. They eventually chopped power and deployed the drag chute and came to a stop with some engines separated from the airframe and the airplane beyond repair. Fatigue after a long night trip to the UK may have contributed to the problem.

There are other cases of losses caused by mechanical or electrical problems and maintenance and operational mistakes. These are common to all airplanes. I have tried to include only those that give some insight into the B-47 and its strange combination of new and old technology. The airplane and its crews contributed significantly to winning the Cold War, but we should never forget that a lot of good people paid a price for the victory.

ALERT

By Lt. Colonel Edward W. Jedrziewski, USAF (Ret)

When I first came to SAC in 1959, our war plans operated under the policy of massive retaliation. Later, we adopted a posture of mutual assured destruction. Somewhere in there we even may have had graduated response. Regardless of the plans, life for B-47 crews on alert did not change. It amounted to being prepared to dash to the aircraft, start engines, and then either shut down, taxi through a simulated takeoff, or takeoff and go to war.

We did a lot of the first, which was called an Alpha. I can recall only a few of the second, which was called a Bravo. Obviously, we did none of the third, or we would have vividly remembered it. The reason for our being on alert was to prevent ever having to go to war; and the eventual triumph of the Cold War illustrates the long-term soundness of the policy.

Alert was conducted both in the U.S. and at the reflex bases. In the United States, it amounted to moving into a facility near the airplanes for a period of seven days. We were permitted to move around the base for personal reasons and for various types of training, as long as we were within hearing distance of a klaxon. Upon hearing a klaxon and depending on where you were, you either ran or drove a vehicle to the airplane, started engines, and reported a readiness to the command post.

Family contact on alert was limited to such areas as the officer's club or picnic grounds. To the best of my recollection, alert duty in the U.S. amounted to about one week out of every month. At the reflex bases, it was one week on, one week off, one week on, and then a return to the U.S.

Life for individuals on alert varied greatly, mostly because of the types of personalities. Some people actually relished the experience, while others felt like caged tigers. Regardless of personality, after a few years of one week per month in the States and numerous reflex tours, a large number reacted to nervous tension, which was often aggravated by the strains such duty placed on family life.

I was a bachelor during my time in SAC. While I did not experience the strains associated with having a wife and children, I did have the opportunity to observe such individuals. After four years of observation, and later experiencing thirty years of family life with a wife and children, I concluded that crewmembers generally could be grouped into categories that illustrate their reaction to alert.

First let me say that all crewmembers fell into the category of professionals doing a job that they considered important and took seriously to the exclusion of everything else. Absolutely nothing interfered with the awesome responsibility that the crews carried. They chose the Air Force voluntarily, and the fact that they were in a situation that was not pleasant did not detract from their sense of duty.

The categories discussed below give some idea of how people reacted to alert. There are probably others, but these are the one that come to mind.

Those who liked it. Most of us couldn't believe that someone like this could exist. To be honest, there were only a few. In retrospect, they probably looked upon alert as an opportunity to get away from the wife and kids for some peace and quiet. It is possible that this type had a strong self- sufficient wife, maybe the kind that wore the pants in the family.

The worrier. This individual believed that the wife and kids could not get along without him. He was probably from a family where the husband was dominant, and was frequently on the phone with the wife, giving advice and running things remotely. A subset of this was the individual that had a valid reason to worry, possibly because the wife was not self-sufficient. This kind did not voice any concern but could be detected from behavior.

The horny complainer. This type was frequently vocal about how tough it was to do without sex for a week. A frequently heard statement was "that when I get home after alert, the second thing that I am going to do is put my suitcase down."

The professional crewmember. You could recognize this kind because he sat around reading the "Dash One" aircraft manual. Conversation with these individuals usually involved discussion of some obscure detail of the airplane or a step-by-step quotation of some standardization procedure.

The hobbyist. Spare time involved hobbies such as model building and gun stock carving. One individual spent hours aiming a pistol that he shot competitively. Another tried to make use of the time by trying to get a tan under a sun lamp. After suffering burns when he fell asleep, he concluded it was not a good idea.

The gambler. Gambling was the most popular form of diversion. The less adventurous played gin or bridge for small money. Next up the scale was a quarter limit poker game. Back alley craps occasionally happened, but at the top of the heap was the classic SAC, or Air Force, poker game. It was called dollar poker.

The minimum and maximum bet was one dollar, paper money only was used, there was a three-raise limit, and it was high and low. One joker, nicknamed the "bluke", was used and was wild only with aces, straights, and flushes. In order to allow a player to call "both ways", straight and flushes didn't hurt you for low. In other words, a perfect low was ace, two, three, four, five. This was known as a "wheel". I played a lot in this game, so I can provide more detail that may be amusing.

The poker game started in the late afternoon after required training was over. A fresh deck was always used and was provided spontaneously by any of the players. It sometimes ran until about four in the morning, with only a short break for the evening meal. After the game broke up, a couple of hours of sleep was caught before breakfast.

Skill levels varied widely. There were quite a few who had paid for their lessons early in life, and there were some of us who occasionally paid to be taught the finer points of the game. Even for a newcomer like me, it was cheap entertainment.

We had people who floated into and out of the game. Some of the married crewmembers apparently operated under a spending budget, and being a bachelor, I frequently became a no interest lender. I kept a record in my crew notebook, and in three years I only lost five dollars in loans, and that was to a slow-witted navigator, not typical of the kind we had who probably forgot about it. Before the navigators take offense, let me say that the best poker player I encountered in those years was a navigator.

We had only one compulsive gambler that I can recall. He was on a budget and was under strict orders not to borrow, so he didn't lose much before he quit. I recall once folding a winning hand so that he could win, and he got the shakes from the excitement. In general, all individuals had the self-discipline to play sensibly and not lose to the point where it was a burden on their families.

Craps was the simple back alley game where you either won on the first roll or got a point, and then rolled until you either made the point or sevened out. The shooter was the banker and covered as many bets as he wished. However, some side bets were made. This was not a high stakes game. I recall once on reflex in Spain, I was on a hot streak, and cleaned out the game. It amounted to a bit over ninety dollars before nobody wanted to bet anymore.

We had pool tables, but we didn't have serious pool shooters. There apparently was not a "Minnesota Fats' in the crowd, and I don't recall any serious wagering.

We bet on various other things, such as scrabble, Vegas solitaire, Wimbledon tennis, foot races, and model car races. In other words, if someone could identify a game or event that had a wagering potential, money was put down and readily covered.

When McNamara took over as Secretary of Defense in 1961, gambling slowly declined because the reflex tours became a financial sacrifice for the crews as well as an emotional strain. During the Eisenhower years, people were paid a per diem of about six dollars per day when on reflex. McNamara's whiz kids apparently decided that because lodging and low cost meals were provided, the crews were entitled to a reduced per diem of about a dollar a day.

Their numerical analysis made no provision for the costs of family separation, where the husband was not at home to take care of chores and tasks such as plumbing and auto repairs that the wife had to pay someone to do in his absence. Military pay was not high in those days, and the married guys flatly stated that they were not in a position to risk even small money on wagers. The whole atmosphere soured, and we lost one of the means to relieve stress.

Being a bachelor, the reduced per diem did not bother me; but the illogic of it gave me insight into what was to come, when these same whiz kids and their

leader used arrogant intellectual numerical analysis to conduct a war in Vietnam. Looking back from the perspective of 2002, I wonder how many of them have done a numerical analysis of the names on the wall of the Vietnam Memorial, and totaled up how many are there because of their arrogance. You could even extend the analysis, and try to measure how much devastation was wreaked on the families.

Another factor that contributed to the decline of the poker game was that two of the regulars, a navigator and an aircraft commander, were killed in separate B-47 crashes. It sort of took the wind out of the sails, and coupled with the financial strain, the game disappeared in about mid-1962.

The spectator. Most of the gambling games had more spectators than players. Apparently individuals got as much pleasure from watching as from playing, and at much less expense. In the poker game, many of the spectators standing behind a player expected to be shown the cards that were drawn, just as if they were playing. There were unwritten etiquette rules that governed spectators, and they presented no major problems.

Looking back all those years, the Air Force leadership tried to make alert living as pleasant as possible. However, this was a difficult thing to do, because no matter how hard you tried, you were dealing mostly with people who really didn't want to be there.

Living conditions at home and at the reflex bases were above average for military circumstances, and a lot of effort went into making the food a pleasant experience. Eating became a major event in a day, and most people showed up when the dining facilities opened. The young crewmembers could put away a lot of food, but being overweight was not a problem except for a few; and it was not tolerated even then.

There was not much outside stress on the bachelors, who had no responsibilities of note when they were on alert or when they were not. The picture was considerably different for the married types, and varied depending on the strength of the marriage and the fortitude of the wife. There are numerous cases of alert contributing to separation, divorce, and even suicide.

Regardless of whether a crewmember was single or married, the klaxon and alert response led to accumulated stress. After years of klaxon response, people got a bit spooky and had a tendency to flinch at unexpected noises. Being awakened by a klaxon during the small hours of the morning was not good for anyone's stability. This was eventually recognized by the leadership, and alert responses during normal sleeping hours were done away with.

The stress from alert was at its peak during the Cuban missile crisis. Nearly all crews were on alert at home or at the reflex bases for nearly thirty days continu-

ously. This was the only time I ever saw a crewmember get emotional and openly state that he had had enough. However, he calmed down, recognized his duty, and life went on.

Senior Air Force leadership consisted mostly of people who had been hardened by the air war over Europe in World War II. They matured rapidly in a time when losses were high and a lot of young men made the ultimate sacrifice. They had little sympathy for the younger crewmembers that were stressed by alert. After all, they weren't being killed.

Some of us would occasionally wonder if they had developed a mind-set where they thought that the job was not being done unless people were hurting. We knew that the mission came first, but we frequently wondered if people had to come last. There was a lot of leadership by fear, and once that started at the top, it propagated all the way down to the crew level. An aircraft commander once openly commented that the reward for doing a good job was to not be punished.

The spot promotions that went to a relative few hardly made up for the personal sacrifices that crew members made during those days of serious belief in the Soviet threat. When I think of the Berlin wall falling, I mentally total up the price that a lot of good people, including families, paid.

Humor was used to ease tensions, and we tried to find it wherever we could. Frequently, it fell into the category of gallows humor. I recall an instance when a few of us were going to ride back to the U.S. from Spain on a KC-135. We were sitting under the airplane in the shade waiting for the tanker crew to arrive. Someone pointed out that we were directly below the refueling boom, and that it might fall on us. Nobody moved, and we all laughed when there was a comment that the worst thing that could happen is that we might be killed. This was only about three hours after a navigator we knew well had been killed at that reflex base in a landing accident. We all knew that if the flight schedule had been different, any one of our crews could have been in the accident.

Getting off alert was one of the few pleasant experiences in SAC. Earlier, I mentioned what a lot of the married types talked about doing. My reaction upon arriving home after alert was relief at being away from the situation; and in the later years, the first thing I usually did was sleep soundly for about eight hours.

When you look back, alert was an important part of a credible deterrent force. However, it took its toll on individuals and families far beyond what any political leaders could visualize. It was yet another example of the few sacrificing for the many, and the many didn't even understand the depth of the sacrifice and the bargain they were getting for all those years.

B-47 and F-86 Mid-Air Collision

By Colonel Howard Richardson, USAF (Ret)

During February 1958, the 19th Bombardment Wing, Homestead AFB, Florida, scheduled a USCM (simulated combat mission), which used B-47 aircraft loaded with nuclear weapons, the Mk.-15. However, the weapon did not include the detonating capsule so that the weapon would not explode in an accident or if it was released in flight. We were fueled to the maximum, which included full wing tanks. Takeoff took almost the entire 12,000-foot runway and was assisted by water injection during the takeoff roll. Aircraft proceeded in pairs, a loose formation. Climb was made up the middle of Florida. In the B-47, a normal level-off altitude is around 28,000 feet. As the mission progresses and the aircraft become lighter, the B-47 will end up at around 40,000 feet at the later part of the mission. Of course, when you complete air refueling, you have descended and then gradually climbed back up as you burn off your fuel.

Our craft consisted of myself as Aircraft Commander, Co-Pilot, 1st Lt. Robert Lagerstrom, and Radar-Navigator, Capt. Leland Woolard, who was flying as a substitute for our regular Bombardier-Navigator. As we approached the Cape Canaveral area, we always watched and sometimes saw the launch of a missile. We turned on a westerly heading, proceeding to our KC-135 tankers, where we completed our scheduled air refueling. We continued westward, and then turned north on a route, which took us close to the Canadian border. We then turned on a southeasterly heading for our target at Radford, Virginia. We were exposed to enemy fighters and used our ECM (electronic counter-measures) gear.

After our target release, we headed on a southerly heading, toward friendly territory. We were past the enemy around the Carolinas, and we were relaxed as we proceeded toward our home base, Homestead AFB. Our cruising level was around 39,000 feet and the weather was clear, visibility was excellent but we were putting out contrails. The temperature was extremely cold at this altitude. All during the flight I had been making radio calls to the FAA (Federal Aviation Administration), selecting fuel tanks and watching the CG (center of gravity) and moving fuel around. The Co-Pilot was busy recording the fuel log; operating the ECM and taking celestial shots for the Bombardier-Navigator. We started noticing fighter aircraft flying below and underneath us, going west then east. We were in friendly territory and were not too concerned about enemy aircraft.

About thirty minutes after midnight EST, 5 February 1958, as we approached the South Carolina-Georgia border, we felt a terrific jolt and a bright flash of light occurred off our right wing. The Co-Pilot and I saw the #6 engine slanted down

forty-five degrees, hanging by the front part of the engine to the wing. It appeared that it might fall off at any time. The right wing tank was missing.

Our cockpit was forward of the wing so that we could not see the surface of the wing, but we could see metal sticking up on its trailing edge. I don't know why, but the Co-Pilot and I said it had to have been a mid-air collision. He started calling "Mayday – Mayday" and trying to reach someone on the radio guard channel. We knew our nearest SAC (Strategic Air Command) base was Hunter AFB, GA. I told both crewmembers to forget about using our ejection seats until we determined how flyable the B-47 was. Lagerstrom contacted the Hunter tower, gave them our condition and asked them to relay this to SAC HQ (head quarters) and Homestead.

I then told the crew that I was going to descend to 20,000 feet altitude, put flaps and gear down and determine at what airspeed we could control the aircraft. I asked the Bombardier-Navigator to let me know when we could drop the left wing tank to hit in a wooded area rather than some home or highway. We dropped the tank and lowered the flaps and gear. I slowed the B-47 to around 220 knots and figured I could control the aircraft at that speed for approach and landing. I had been an instructor pilot, had in excess of 1500 hours in the B-47 and had a pretty good knowledge of its flying characteristics. We brought the gear and flaps back up and descended toward Hunter AFB. We talked about whether to keep the Mk.-15 bomb. Tactile Doctrine listed the safety of the crew as the number one priority, if a decision was to drop the weapon. The Hunter tower told us that the runway had been under repair and the beginning of the runway was about a foot above the ground and had not been smoothed out. We thought that if we landed a little short the aircraft would catch the front of the runway and the Mk.-15 might proceed toward the cockpit like a bullet through the barrel of a gun. We would also quickly lose 7600 pounds of weight, which might help the airspeed. Thus, we decided to jettison the Mk.-15. We called the Hunter tower and told them what we were planning to do and asked them to call SAC HQ and get their blessing.

We descended out over the Atlantic Ocean, and then made a wide turn back toward the airbase. We had not heard from SAC, but decided to drop the weapon. Right after this, the tower called us and said that SAC approved the drop but ordered us to go twenty miles offshore. We advised the tower that we had already released the weapon. I asked Woolard to make sure that he had the coordinates of the release. We made a wide base leg and turned on final, lining up with the runway. The wind was no problem, but my airspeed was high, on purpose. Since the #6 engine was slanted down we didn't know whether it would drag on the runway. With gear and flaps down, I reduced the airspeed to 220 knots. I estimated my landing speed would be around 180 knots or less.

Trying to keep the right wing up and continuing to keep lined up with the runway became quite a problem. As we reached the runway I reduced the airspeed more. When we did ease down to the runway, we were still fast and did a small skip. When we reached the runway again, I pulled the brake chute, eased on the brakes and brought the B-47 to a slow speed, slow enough to turn off the runway. Fire trucks and ambulances were all around, plus the operations automobile with the ops officer and safety officer.

We all got out of the aircraft and I think we all kissed the tarmac. Reviewing the B-47, we found the right aileron pushed in twenty inches deep and four feet long. We found out later that the main spar was broken. There was a big hole in the vertical stabilizer, in the empty fuel tank and another hole in the horizontal stabilizer right behind the ECM plates on the right side of the fuselage and the tail turret. We learned later that the aircraft never flew again.

We were taken into base operations and given a room in the VOQ. When we arrived at our rooms, I asked both the crew members to write down everything that they could remember about the collision and landing. I had been exposed to other accident reports and knew how the crewmembers were grilled about every detail. By this time, we had conditioned ourselves to the fact that we would be around Hunter for some time until the Court-Martial was completed.

We landed at 01:26 EST, went to bed, slept a couple of hours before we were awakened and told to get ready to brief General Power, Commander of SAC who was on his way from Homestead in his KC-135. We proceeded back to Base Operations, back down on the flight line. We reviewed our notes and prepared for the worst. I briefed the General and his staff with the help of a map, showing them about where the mid-air had occurred and our flight path to a landing. After the briefing and after answering all of the questions, General Power told us to get our gear and board his aircraft and that he was taking us with him on the flight back to Homestead.

General Power always did the takeoff; after he leveled off, he came back and talked to the three of us. He said that he had talked to General LeMay, who was CINC, USAF and asked for permission to pin a DFC on me and Commendation Medals on the other two-crew members. General LeMay said that HQ, USAF did not operate that fast but that we would get the medals later.

General McConnell, the 2nd Air Force Commander, was on board. He returned to Homestead later and, at a formal formation, he presented the DFC to me and the Commendation Medals to Lagerstrom and Woolard. Later on, I was working at Division headquarters when the accident report was forwarded to 2nd AF and SAC. I added a recommendation to the report that anti-collision lights should be considered for all military and commercial aircraft to help prevent mid-air col-

lisions. The 19th Bomb Wing commander, Col. Cloyd, offered me a spot promotion to Lt. Colonel. I asked him to consider me for the next Squadron Commander vacancy that needed to be filled. He did this soon thereafter.

We were told later that the pilot of the F-86H had ejected immediately after the collision and descended in a thin summer flying suit, landing in a small clearing in the biggest swamp in Georgia. He was found by some locals who took him to the house of a forester. This individual brought out the family whiskey and gave him some shots that probably saved his life. He spent over a month recovering from wounds and frostbite. We learned that he, Clarence Stewert, also stayed on active duty, retiring in 1977.

I later checked out in the B-52H and served in operations and other staff positions. I completed thirty-one years service and retired in 1973 as a Colonel. Leland Woolard died in 1986 and Bob Lagerstrom went on to become a Captain for American Airlines where he retired not long ago.

Cold Humor During the Cold War

By Major John P. Noonan, USAF (Ret)

During the late 1950s, there was an aircrew in our wing that was noted for having at least two practical jokers in their number. We were flying the RB-47E aircraft, and assigned to Lockbourne Air Force Base, located in Columbus Ohio.

Our story begins as our stalwart aircrew was returning to the Lockbourne local area after completing the reconnaissance portion of their mission. It was a beautiful sunshiny day with hardly a cloud in the sky. The aircraft commander remarked that he would like to log some instrument flight time, but there was no "weather" to warrant such an endeavor. The navigator, who was eating his flight lunch said, "Standby a minute and I'll fix you up." Whereupon he opened his periscopic sextant port directly in front of the pilot's windshield and stuck his open carton of milk up to the hole. The suction from escaping pressurization sucked the milk out into the slipstream and onto the pilot's windshield, where it immediately froze into an opaque glob, covering the whole windshield.

The crew, at first, thought it was pretty funny and the navigator even said, "Now you have your restricted visibility and you can practice your instrument flight procedures." However, it soon became apparent that the frozen milk was not melting and the pilot had no forward visibility. This situation would make an attempted landing "tricky", if not downright dangerous. Upon this realization, the pilot said" navigator, if we have to have the wing commander scramble a tanker to

hose off our windshield, you are in serious trouble!" So the navigator tried holding a cup of water up to the port and repeat what he had done with the milk. Because they had descended to a lower altitude, he had no luck, as the suction was insufficient to suck the water out of the cup. He then resorted to taking mouthfuls of water and tried squirting them out the port. Again, he was foiled and only succeeded in getting himself all wet.

Fuel and ideas were running low at this point, and the pilot still didn't want to admit to the world that he and his crew were in a predicament they had gotten themselves into. Then the pilot had an idea that he thought might work and still save themselves a lot of embarrassment. If there were any rain showers in the local area, maybe, Columbus Approach Control radar could vector them through one and hopefully, wash the milk off the windshield. So he called, "Columbus Approach Control, this is Derby 29, do you have any rain showers in the local area?" Approach Control answered, "Derby 29, I'll look." After a minute or two, his curiosity piqued, he came back, "Derby 29, there is a pretty good-sized shower over by Buckeye Lake." Pilot of Derby 29 to Approach Control, "Roger approach, would you mind vectoring me through that shower?" Approach to Derby 29, " Turn to heading 080 degrees and twenty-two miles to Buckeye Lake." The controller's curiosity was building higher as he watched the progress of Derby 29, but the shower had quit by the time the aircraft arrived. So again the Pilot of Derby 29 asked if there were other showers close by. He, Approach Control, was extremely curious by this time as to why an aircraft that ordinarily would want to be vectored around rain showers was instead requesting a vector through one. The controller spotted another shower and said, " Derby 29 there is another shower North of here, turn to 340 degrees at 15NM." Derby 29 pilot to Approach, " Roger 340 at fifteen miles." In a very few minutes the bomber flew through the shower and "VIOLA", it washed the milk off the windshield. The elated pilot of Derby 29 said matter-of-factly, "Thanks a lot Approach, that did it!"

Approach Control came back even more curious, "By the way Derby 29, just why did you want to be vectored through a shower?" Derby 29 Pilot answered, "To wash the milk off the windshield approach control!" Approach Control to Derby 29, "Say again, did you say M-I-L-K (milk) off the wind- shield?" Derby 29 Pilot, " That's affirmative Approach!" Approach Control, "Derby 29 how did you get Milk on your windshield?" Derby 29 Pilot (not wanting a truthful explanation over the air) said, "We hit a cow, Approach!" There was Silence from Approach Control.

That ended THAT episode. Derby 29 and crew landed safely at Lockbourne AFB without further incident – (THAT DAY).

Runaway RB-47 (Unmanned)

By Major John P. Noonan, USAF (Ret)

It was a beautiful fall day in Ohio and my crew, (Captain John "Bud" Callahan - pilot, myself - copilot and Captain Philip J. Allison - navigator) was scheduled for a test flight (test hop) of an RB-47E, which was our assigned aircraft.

Preflight, launch and flight test were all accomplished with no problems and we returned to the penetration fix with the intention of landing at Lockbourne (our home base). We were cleared for penetration and approach and started down. Somewhere in the penetration turn, Approach Control advised us that the runway at Lockbourne was now closed due to an aircraft accident.

Our neighbor airfield "Port Columbus" across town from LCK was a Navy airfield in addition to serving as a commercial aviation terminal. It also housed a North American Factory facility. An F-100 aircraft had departed from Port Columbus and left part of his landing gear "hanging" on a construction crane off the end of the runway. The usable runway at Port Columbus was too short and emergency equipment not adequate for an attempted gear-up landing. The runway and ramp were being lengthened and expanded to accommodate more airline traffic. Hence, the F-100 Pilot was not comfortable with attempting a landing at Port Columbus. So he was diverted to Lockbourne where runway length and foaming with adequate emergency equipment were compatible with this problem.

The F-100 had taken off about the time we entered traffic for penetration. He declared an emergency and they closed the runway at LCK for normal traffic. We asked Lockbourne tower how long the field would be closed. The tower stated, "About twenty minutes." As we had adequate fuel, at this point, Bud elected to remain at low altitude (traffic pattern altitude). We did, however, retract the landing gear and flaps. At the expiration of the twenty minutes the F-100 was still on the runway and outside of fire/crash equipment, it did not appear that they had made any progress in removing the wreck. Again, Bud asked how much longer it would take to clear the active runway. Again the tower assured us it would be clear in another twenty minutes. Our fuel supply was dwindling, but still more than adequate, if we could land at the end of that time. So we continued to orbit the field at pattern altitude.

By this time, other aircraft (RB-47s) had arrived with intention of landing. Some like us, at traffic pattern altitude but most stayed in a holding pattern at altitude or diverted to Port Columbus, when fuel dictated.

At the termination of the second twenty minute segment of time the F-100 was removed from the LCK runway and Bud Callahan requested clearance to land. LCK Tower informed us it would be an additional twenty minutes to clear the

foam and debris off the runway. We were not "Happy Campers", as we had committed to landing at Lockbourne and now our fuel would not allow for another fruitless wait with another extension. So Capt. Callahan thanked LCK tower, through clenched teeth, and angrily switched to Port Columbus tower.

By this time we were number five or six in line for landing there. Besides being low on fuel, we were forced to land on a short (7,000-foot) strange runway. The sun was sinking below the horizon and dusk was approaching. When our turn to land came "Bud" was under pressure to make a one shot approach, and on touchdown he "kissed off" the nose gear and started a porpoise. On the second bounce he called for the brake chute. Our luck seemed to be back as we settled in for the third and final touchdown, smooth as glass.

As I have mentioned the airfield was under construction and the ramp we were directed to, although new had a considerable slope to the south. There were already three RB-47s parked on the South and we were directed to join two others on the North (high side of the ramp). The Navy had no chocks suitable for our size aircraft. Therefore, crews landing ahead of us set their parking brakes and most left the ramp to get some refreshments at the Navy Club. The Navy refueling equipment was not compatible with our systems (i.e. their equipment could only fuel one tank at a time). So LCK was contacted to dispatch refueling trucks, which would involve a wait of an hour or more.

We had parked our aircraft; set the parking brakes and we were standing out in the middle of the ramp in front of it. We were discussing the merits and time available to go to the Navy Club before the refueling trucks arrived. We had about decided to go " grab a sandwich" when Phil, who was facing the high side of the ramp, said in amazement, "That plane is rolling!" Sure enough, the plane next to ours was rolling. The crew had piled their brake chute in a pile in front of the aircraft's front trucks. The aircraft slowed only slightly, if at all, as it rolled over the chute and seemed to gather speed quickly as it accelerated toward two of the aircraft on the low side of the ramp. One or both of them was being refueled, and the runaway was heading into both.

We were initially frozen in disbelief, as we confirmed in our minds that the plane really was rolling and picking up speed. The crew had retracted the entrance ladder and closed and latched the hatch. We were trotting as the plane accelerated on the down slope of the ramp. Bud said, "Get the door open." Phil who was closest leaped up and unlatched the door, which fell open, but the ladder was still retracted and because of low fuel aboard, was riding high enough it would take a leap to come close to the bottom rung. Bud said, " Grab the ladder"! Phil said, " The hell with you, I'm too short!" By this time we were running to keep up. Phil moved out of the way and I decided to try to grab the ladder. I leaped up and got

hold of the bottom rung and pulled hard to get to the second rung. From there I climbed hand over hand. I remember a fleeting thought, "What am I doing here?" I had no way of knowing how close we were to collision with the other aircraft, so I scrambled on up and jumped into the copilots seat and without looking and in one motion I jammed on the brakes hoping against hope that Boeing Aircraft Company had not lied about having three brake applications on the emergency system. The airplane shuddered to a stop as the fourth man's parachute toppled down the entranceway.

I looked up afraid of what I might see. Much to my relief, I had stopped just seconds short of a collision. I also saw the crew chief of one of the planes ahead hanging from the entrance ladder of his plane with wide-eyed disbelief at the monster that had come very close to a collision with probable resulting fire. I also saw Bud and Phil, like two puppy dogs, criss-crossing in front of the now stopped RB-47. Bud was shouting, "Good boy John, good boy John!" At this point my legs were trembling violently and I was afraid to trust Boeing Company too far, by releasing and reapplying the brakes. So I shouted to Bud, "Good boy hell, get up here and turn on the battery switch so I can reset the brakes." He came up the now extended ladder and turned on the battery switch and reset the parking brakes.

I did not have time to really think about what I did. I heard Bud say grab the ladder and Phil's response and somehow realized if it was going to get done, I had to do it. It wasn't until later when Bud started enumerating all the things that could have gone wrong, like missing the ladder, falling in front of the trucks and getting run over, or having the release on the ladder give way and dump me in the same place, or the ladder come loose and trap my hands until the planes collided. There were several other possibilities I don't care to think about, like Boeing overstating the emergency brake capabilities. All I know is, "Someone up there showed a lot of mercy on this person!"

Both Bud and Phil congratulated me on stopping the plane and I thought that would be the end of it. Needless to say, before we left the scene, we rechecked our own aircraft and reset the parking brakes. We also decided to forego the snack as we were still pumped up with adrenaline.

As our fuel truck arrived, along came the crew whose aircraft had nearly demolished two others, beside itself. The copilot shouted, " Who the H_____ moved our aircraft out there in the middle of the ramp?" Bud said, "If you had set your brakes properly, it would still be where you left it"!

The landing on a short runway, which necessitated harder than normal braking overheated the brakes. When they cooled, the pressure bled off releasing the parking brakes.

After refueling, the short flight back to Lockbourne was uneventful. We went through the usual debriefing and left for our homes. I was relaxing with a beer when Bud called on the phone and asked my wife if I had said anything about the happenings of the day. I had not as yet so he told her to ask me. The full import had not caught up to me but on retelling the events to my wife and Bud (Captain Callahans') submitting me for an award; I began to realize the ramifications of the whole thing. Like I said "Someone up there brought me through"! I don't know if I would attempt that feat again and I hope I don't have to find out.

I was awarded the "Soldier's Medal", which at that time was the highest peace-time award for risking one's life in an endeavor of this sort. There was no "Airman's Medal" at that time.

Cold War Over-flight of the Soviet Union

By Colonel Harold R. Austin, USAF (Ret)

The hot subject on both sides of the Iron Curtain in 1954 was intelligence gathering. The political/military situation for the time period around May 8, 1954 was that the Cold War was in full swing and the Korean War was nearing the stalemate that has lasted for more than forty years. We were quite concerned about the possibility of the Soviets attacking Europe and even the United States with aircraft over flying Canada. Russia was equally as concerned about an attack by the United States.

Some of you will remember that by the 1954-55-time period, we had two Strategic Reconnaissance Wings at Lockbourne AFB, Ohio, where my crew was stationed, with ninety RB-47E aircraft plus twenty KC-97 tankers. Also, there were two RB-36 Reconnaissance wings, one at Ellsworth AFB, SD and one at Fairchild AFB, WA. These were the aircraft expected to do the "Open Skies" project, which President Eisenhower had attempted to negotiate with the Soviet Union. It would have been very interesting trying to cover the entire Soviet Union with those 150 or so aircraft! In 1955 President Eisenhower made a careful evaluation of U.S. policy on disarmament. He invited the other four major powers of the world to join in an agreement for the reduction of armaments and on July 21, 1955, at the Geneva Summit Conference, made his "Open Skies" proposal to ensure peace in the world through the use of aerial reconnaissance.

During 1951-53, my unit, the 91st Strategic Recon Wing routinely had about eight RB-45C's and a similar number of KB-29P tankers deployed on temporary duty to England. In late 1953, we transitioned to the new RB-47E for the same job.

During these years our "official" job was to do uncontrolled photo mapping work for the U.S. Army over Europe, primarily the Rhine River basin and later all of Spain, so our maps could be geodetically tied into Eastern Europe. This was a very important requirement because ballistic missiles were soon to be deployed to the NATO area. Our real mission with RB-45C's, we found out later, was to occasionally furnish them to the RAF. (As a matter of interest, a flight of RB-45Cs, with RAF crews had been over Moscow the night of April 29, 1954, just a few days earlier than our day photographic mission.)

ELINT RB-29s, RB-50s and later RB-47 aircraft, were also doing periphery work around the Soviet Union, primarily to keep the Soviet Radar Order of Battle up to date. I believe our overflight on May 8,1954 was the first with the RB-47E visual photo aircraft.

On this particular TDY, my crew, Carl Holt, copilot, and Vance Heavilin, navigator, and myself, had been in England about two weeks when on May 6, we launched a "feint" of seven RB-47Es toward the USSR's "Northern Exposure" taking pictures of the Spitsenbergen Islands, Northwest of Norway, well above seventy-five degree north latitude. Although we didn't know it at the time, this "feint" was to set up our mission of the 8th of May. On the 8th of May, the three RB-47 crews for the mission were briefed separately and apart by two SAC Intel Colonels. Our particular mission was to penetrate Soviet airspace and take pictures of nine Soviet airfields to find out for General LeMay if the "new MiG's" (MiG-17s) were deployed to the area. The other two aircraft were to proceed with us to a point about 100 miles north of Murmansk and then return to base.

Our flight of three RB-47s departed RAF Fairford about 7 AM, refueling with our KC-97s off Norway as we had done two days earlier, flying one mile separation using station-keeping technique (very loose formation) to a point about 100 miles north of Murmansk. The other two aircraft reversed course, as briefed, at that point to return to the UK. Our first Soviet airfield targets were two large airfields near Murmansk. We coasted in at twelve noon at nearly 40,000 feet over Murmansk and the NAV turned on his radar cameras and started the three K-17 large area visual photo cameras. The weather was clear as a bell across the entire Western part of the continent, perfect for our K-17 and K-38 cameras.

About the time we finished photos of the second airfield, we were joined by a flight of three Soviet MiGs. I still don't know whether or not they were armed, but they stayed a couple hundred yards to half a mile off our wing, making visual identification, I guess. About twenty-five minutes later, a flight of six MiGs showed up. I guess this flight confirmed we were the bad guys, because a few minutes later another two flights of three, a total of six MiGs arrived behind us, with obvious intent to try to shoot us down. By this time, we had covered two more major

airfield targets near Arkhangelsk and were turning to the Southwest toward our last two targets. We had been over Soviet territory an hour and were at 40,000 feet. We had been briefed by Intel that the MiG-15 would not be able to do any damage to us at 40,000 feet with our true air speed on the order of 440 knots.

Well, you can imagine what we called those Intelligence weenies as the first Soviet MiG-17, not MiG-15, made a firing pass at us from the left rear and we saw cannon tracer shells going both above and below our aircraft, and, the MiG was still moving out rather smartly as he passed under us in front. So enough of this 40,000 feet stuff, I pushed the RB-47 over, descending a couple thousand feet picking up about twenty knots indicated airspeed in the process. The second MiG-17 made his firing pass and I don't care who knows, it was scary watching tracers go over and under our aircraft. This guy had almost come up our tailpipes. The copilot turned around backward to operate our tail guns after the first MiG shot at us. It was typical for the two remotely controlled 20mm cannons not to fire. I told Holt he'd better kick them or something because if our guns don't fire the next SOB would come directly up our tailpipes. Fortunately, when the third MiG started his pursuit pass, our guns burped for a couple of seconds. General LeMay did not believe in tracers for our guns but the Soviet pilots must have seen something because the third guy broke off his pass and the flight of six, and the next flight which joined us later, stayed out about thirty to forty degrees to the side, out of the effective envelope of our guns. Of course, the MiGs didn't know that our guns would not fire again even though the copilot pleaded, and I believe he did, at least, kick the panel trying to get them to work.

The fourth MiG of this flight made a firing pass and made a lucky hit through the top of our left wing, about eight feet from the fuselage through the wing flap. It exploded into the fuselage in the area of the #1 main tank and knocked out our intercom. We felt a good whap and all three of us were a little bit anxious (scared) but doing our mission as briefed, basically because of habit. I firmly believe that's what good, tough, LeMay-type, SAC training did for his combat crews. Later we also found out, it hit our UHF radio in a way that it would not channelize but was stuck on channel thirteen, our command post common.

By now we had covered our last photo target and had turned due west toward Finland to get the hell out of there. That flight of six ran out of range I guess and, we were near the Finland border. Real soon another three MiGs showed up. Two MiGs of this flight made individual firing passes but our added speed obviously made it a bit tougher, or I am pretty sure I would not be here writing about this mission today. After those two made passes, one of the MiGs came up on our right side, close enough to shake hands and sat there for two or three minutes. Two more MiGs tried firing passes, but without hitting us, by this time we were well out of

Soviet territory. At the debriefing in Omaha, General LeMay asked, "Why were you not shot down?" My answer was that there was no doubt in my mind the MiG-17 pilots could have shot us down, if they had been willing to come right up our tailpipes! He made the statement that he was, "... convinced that most fighter pilots are basically cowards anyway." General LeMay also said, "There are probably several openings today in command positions there, since you were not shot down."

As we coasted-out off Norway, it was obvious we had fallen behind the fuel curve. We climbed to 43,000 feet and throttled back to max-range cruises. It did appear however, that we could get to a base in England and we knew there was a strip alert tanker at Brize Norton awaiting our call. My copilot had spent much of the time since the last MiGs departed sitting in the aisle acting as the intercom between our navigator and me. You just don't realize how handy the intercom is until you don't have one in a tandem airplane.

Holt was beginning to panic on the fuel as we reached a point about 150 miles from the Wash (located in the north-east corner of the UK). He said all this effort was for naught if we have to bail out of the airplane, and left no film for intelligence to process that would prove where we had been. Within about 100 miles of the Wash, I started calling for the strip alert tanker to launch. Jim Rigley, the tanker pilot, said he heard a word or two, enough to recognize my voice (these were our tanker guys, so we all knew each other). Anyway, he attempted to get permission to launch. Well, as it sometimes goes, the RAF had an emergency working at Brize. Rigley announced that he was launching anyway and did. When he returned to base, the Base Commander threatened him with a court martial and British Air Traffic Control gave him a violation, both situations were later "fixed" by General LeMay.

In all of my nine years of flying up to that time, I was never more thrilled to see another airplane in the air than I was to see that beautiful KC-97 that day. I saw Rigley s airplane and headed for it. We had already decided to try to land if need be at Brize Norton, and were letting down to do just that. Holt said, "We're going to run out of gas." Rigley had his guys looking up for us and caught a glimpse of what they thought was our airplane and leveled off at 3,000 feet heading south. I circled once letting down. As we maneuvered and pulled into contact position, Holt said, "We are taking on fuel." He swears to this day, all tank gauges showed empty when we made contact. I told Holt to tell me when we had 12,000 pounds of fuel. When he said "NOW", I punched the boom loose, gave the Boom Operator a salute and headed for Fairford. We buzzed the tower and as we came around, they gave us a green light to land.

When we reached the ramp and parked, the crew chief was first up the ladder, "What the hell kind of seagull did you hit?"

Because of the "need to know" classification, my crew was never allowed to see the pictures we took that day, but General LeMay said they were really good.

If General Curtis E. LeMay was still alive I might have second thoughts on telling about this mission even though it's been over forty years. My crew, Carl Holt, copilot and Vance Heavilin, navigator and myself, were decorated by General LeMay, then Commander in Chief of the Strategic Air Command, with two DFC's each in lieu of the Silver Star, for a single RB-47E visual photo recce overflight of the Soviet Union. When General LeMay presented our DFC's he apologized stating that the recommendation for the Silver Star had to be approved in Washington which could cause two problems; first they'd get the thing screwed up, and second, and I quote, "I'd have to explain this mission to too damn many people who don't need to know."

Comments From the Back Seat

By Captain Carl Holt, USAF, (Ret)

It was a clear day (not a cloud in the sky) as we coasted in to the Soviet Union. Suddenly we started to generate contrails like six white arrows pointing to our airplane. (Not in the forecast!) As we passed over our first recon target I could see the fighters circling up to meet us and knew it would only be a matter of time before they reached our altitude.

When I saw the flashes of fire from the nose of the fighters I knew it would not be a "Milk Run." I had trouble getting the tail guns to fire and since I was in a reverse seat position I could not eject in case of a direct hit. Also, the radar-firing screen would not work so I felt a little like Wyatt Earp, looking out the back end of the canopy and firing at will (visual bore sighting). I did not hit any of the fighters, but it kept them out of a direct rear-firing pass. They could only make passes from either side at a greater than forty-five degree angle.

Later, after we were hit in the left wing and fuselage, one MiG tried to ram us by side slipping his fighter into our aircraft. On one "ramming" pass he stalled out right under our aircraft and our vertical camera took one of the first close up pictures of the new MiG-17. (The Intelligence community was elated at the picture!)

As we coasted out of Finland one of the remaining fighter pilots flew up to our right wing gave us a salute and then turned back toward the Soviet Union.

Having flown combat in World War II and later recalled during the Korean War, I thought we were in a Cold War with Russia, not a hot one, since all the reconnaissance plane "shoot downs" had been kept very secret. During our debriefing with General LeMay, I said to him, very innocently, "Sir, they were trying to shoot us down!" Smoking his usual long cigar he paused leaned back and said, "What did you think they would do, give you an ice cream cone?" His aides all smiled, but I was serious.

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Overflight – Strategic Reconnaissance of the Soviet Union

By Colonel Donald E. Hillman, USAF (Ret)

In the last few years, accounts of early clandestine American aerial reconnaissance flights have appeared publicly in Russia and the United States. Virtually all of these flights, which began in 1946, took place around the periphery of the Soviet Union, probing it's radar defenses and attempting to obtain oblique photographs of military installations a few miles inside Soviet territory. But some of them, an exceptional few in violation of international treaties, actually traversed Soviet territory seeking indications of any military preparations that might portend a surprise atomic attack on the United States. Whatever the mission, pilots and crews of the United States Air Force and navy reconnaissance aircraft knew of the risks they took and, in the interests of national security, accepted them. During the Cold War a number paid for that risk – lost to Soviet fighters that engaged them over international waters or in Soviet airspace when they strayed across the border. (The tension thus created for service participants on both sides was enormous; military careers could be secured or ruined depending on the aerial outcome. This state of constant tension helps explain the tragic shooting down of Korean Airlines flight 007 that inadvertently entered Soviet airspace on August 21, 1983.) But of the American flights that intentionally over flew Soviet territory on White House orders, none was lost until Francis Gary Powers' U-2 was shot down on May 1, 1960. Now that the security restrictions associated with these early flights have been lifted and most of the documents declassified, I can relate the story of what I believe was the first Presidentially authorized overflight of the USSR during the Cold War.

Background

International events in the late 1940s and early 1950s brought the major powers closer to another war than is generally supposed. In February 1948 a communist coup in Prague ended the independence of Czechoslovakia. In June of that year, Soviet troops blockaded Berlin to surface transport, prompting from the Western powers the successful "Berlin Airlift." In August 1949, the Soviet Union exploded an atomic device and eight weeks later communist forces seized China. A few months afterward, in the spring of 1950, communist North Korean forces launched a surprise attack on the Republic of South Korea and in November, Chinese communist forces entered the conflict. The sequence and pace of these events, coupled with available intelligence, prompted American political and military leaders to believe that the Soviets and their counterparts might well be preparing to occupy western Europe, coincident with a surprise aerial attack on the United States. While the Joint Chiefs of Staff prepared war plans to counter a Soviet strike in Europe, in December 1950 President Harry S. Truman authorized the first overflight of Soviet territory to determine with certainty the status of its aerial forces in those regions of Siberia closest to this country. That mission had to be canceled in early August 1951, however, when the aircraft selected to conduct it, the fourth B-47B specially-modified on the assembly line, was destroyed by fire during refueling operations at Eielson AFB in Alaska. Any rescheduling awaited the production of more B-47Bs.

In the spring of 1952, with communist and United Nations forces on the Korean Peninsula locked in a military stalemate, U.S. leaders received firm intelligence that the Soviet Air Force had begun staging bombers into Siberia. These Tu-4 aircraft, essentially copies of the B-29, were flying together in unit numbers into and out of airfields on Dickson island in the Kara Sea, at Mys Schmidta on the Chukchi Sea, and at Provideniya on the Chukotskiy Peninsula, just across the Bering Strait from Alaska. Given increased numbers of nuclear weapons presumably available to the Soviet Air Force, these Tu-4s could be directed on one-way flights against the United States in a devastating attack. Officials in the Department of Defense (DOD) and the Central Intelligence Agency (CIA) again sought permission to photograph certain air bases in Siberia through aerial over flights. On July 5, Headquarters USAF directed the Strategic Air Command (SAC) to modify two B-47B bombers for just such a special photo-reconnaissance mission over "unfriendly areas," in the event it was requested.

A few weeks later, on August 12, 1952, Secretary of Defense Robert A. Lovett delivered to President Truman memoranda from General Omar N. Bradley, Chairman of the Joint Chiefs of Staff, and General Walter Bedell Smith, Director of the CIA, requesting two reconnaissance over flights of Soviet Siberia. After discus-

sion, the President approved "the Northern Run" between Ambarchik on the East Siberian Sea and Provideniya on the Chukotskiy Peninsula, but disapproved a "Southern run" between Petropavlovsk on the Kamchatka Peninsula and Provideniya. His approval of the one reconnaissance overflight, Truman told Lovett, moreover, was contingent on the concurrence of "appropriate officials of the State Department. Secretary of State Dean Acheson must have concurred, because, on August 15, Headquarters USAF issued instructions for the mission and directed SAC to deploy the two modified B-47Bs to Eielson AFB.

In 1952 I served as Deputy Commander of the 306th Bombardment Wing, at that time the first and only B-47-equipped wing in the Air Force, stationed at MacDill AFB, Florida. Although unaware of the preceding actions and events in Washington D.C., I became involved in the mission in late July or early August. At that time, without offering any specifics, Major General Frank A. Armstrong, Jr., Commander of the Sixth Air Division, which was co-located with us at MacDill, asked me to accompany him to Headquarters SAC at Offutt AFB, in Omaha, Nebraska. There, the CINCSAC, General Curtis E. LeMay, briefed us personally. Intelligence reports from several sources, he said, indicated that the USSR was constructing a number of air bases in Siberia from which attacks against the United States could be staged. In the interests of national security, it was judged necessary to verify these reports with aerial photography if possible. To that end, I had been selected to lead a flight of two B-47Bs over the Soviet territory in question.

Project 52 AFR-18

The mission itself, identified only as Project 52 AFR-18, had been assigned the highest security classification. At headquarters SAC, only General LeMay, the Director of Operations, Major General John B. Montgomery, and the Director of Intelligence, Brigadier General James H. Walsh, knew the details. In the field, for the time being LeMay advised, only General Armstrong and I were to know the mission plan. It called for two B-47Bs, one designated as primary and a second as a backup to improve chances for a successful mission, to stage out of Eielson AFB. The two aircraft would fly together in a northwesterly direction, each refueled by a KC-97 shortly before leaving the Alaskan Arctic. Both B-47s would continue to a point where the Bering Strait meets the Chukchi Sea north of Siberia. There, the backup aircraft would orbit on station, flying a racetrack pattern while serving as a communication relay or, if required, replacing the primary aircraft were it forced to abort the mission before entering Soviet territory. The primary aircraft would continue on a course north of Wrangel Island, then swing to the southwest over the East Siberian Sea until it made landfall in northern Siberia between Ambarchik and Stanovaya, turn due south for a time, then swing eastward back toward the

Bering Strait, flying a zigzag pattern that would take it over the reported airbases. Some of these, intelligence believed, were refurbished airfields built to accommodate the westward movement of B-25s, C-47s, and P-39s flown to the Soviet Union during the World War II lend-lease program. Finally, flying in an easterly direction, the primary aircraft would exit Soviet territory over Chukotskiy Peninsula and turn northeast over the Bering Strait for the run home to Fairbanks, Alaska.

Back at MacDill, I began planning details for the flight in the strictest secrecy, spending long hours in my office behind locked doors. Two B-47Bs were modified at MacDill in mid-August with special radar and photographic cameras installed in the bomb bay. My copilot in this venture, Major Lester E. "Ed" Gunter, recalled at that time all Boeing B-47s were grounded while the Air Force investigated the cause of several fatal accidents. But we were directed to continue to fly training missions with our two aircraft, underscoring the urgency of the impending mission. Two KC-97 tankers, of the 306th Air Refueling Squadron, were designated to transport the necessary men and equipment from MacDill to Eielson AFB and to refuel both the B-47s just before they left Alaskan territory on the outbound leg of the mission.

On the planned flight north, to maintain cover for the mission, all four of the aircraft would stage through Rapid City AFB in South Dakota, as though on a routine training exercise. Not until we reached Eielson in September would the rest of the flight crews be briefed on the mission details and it's true purpose. Air Force intelligence advised me that we could expect resistance from a MiG-15 regiment that was stationed in the Siberian target area, headquartered in Provideniya. Furthermore, once detected, we could also expect fire from anti-aircraft artillery. Because this photographic reconnaissance mission absolutely depended on the presence of fair weather in Siberia, we would be all the more exposed to detection and interception. Our defenses relied on surprise, navigational tactics, the aircraft's speed and high altitude, electronic countermeasures, and two temperamental, electronically controlled, General Electric 20mm cannon in the tail of the B-47B.

At MacDill, we filled the last few weeks of August and early September with training flights to acquaint ourselves with the operation of the radar and camera equipment. General Armstrong, who held authority to approve or deny the start of the mission based on weather predictions, named me pilot of the primary aircraft and Colonel Patrick D. Fleming as pilot of the backup aircraft. The hand-picked aircrews consisted of Majors "Ed" Gunter, copilot, and Edward A. "Shakey" Timmins, navigator, serving with me in aircraft one, and Majors Lloyd F. "Shorty" Fields, copilot, and William J. "Red" Reilly, navigator, with Fleming in aircraft two. When our families gathered at a MacDill Officers Club social a few evenings before our scheduled departure for Rapid City, Armstrong took my wife aside and

told her: "I feel like I am sending Don on a mission equivalent to sending Christ to Calvary." If the words eased his conscience, they certainly generated wifely concerns on the home front, and there was little I could do or say to allay them.

The four mission aircraft departed MacDill on Sunday September 21, 1952, and flew the first leg to Rapid City AFB. There, during a six-day layover, we conducted some additional training flights. The B-47B had just begun to be produced at Boeing the year before and was still quite a novelty. For that reason, the wing commander at Rapid City AFB, Brigadier General Richard E. Ellsworth, asked for a ride on one of our local flights. We strapped him in the copilot's seat in the rear, while Ed Gunter, my copilot, rode in the aisle alongside. The navigator, Shakey Timmins, occupied his normal position in the nose. After completing the preflight checklist, we started down the runway at full throttle. Gathering speed, about one third of the way along, I glanced down at the instruments and saw to my horror that the flaps were fully retracted. Somehow, in the mixed crew configuration, we had missed that vital check. Without flaps, our takeoff could not succeed and would end in a disastrous fireball when we ran off the runway at 200 knots. At this point, our speed and position ruled out a ground abort. I pulled down the flap handle and watched the flap indicator creep slowly downward, very slowly downward! Somehow we did make it, but I was looking at grass when our B-47 reached flying speed. Almost every pilot experiences a close call of one sort or another in a career of flying-and I *never* forgot this one. Project 52 AFR-18, and the lives of the primary crew nearly ended in Rapid City, South Dakota.

On Sunday, September 28, 1952, we flew our B-47Bs from Rapid City to Eielson AFB. One KC-97 had departed for Eielson a day earlier, on Saturday, and the second followed a day later, on Monday. Clear weather during daylight hours now became the determinant, for only these conditions would ensure the success of visual photography; radar imaging, also an important part of our mission, would be unaffected by darkness or cloud cover. At that time of the year, at sixty-five degrees north latitude, there are approximately ten hours of daylight between 0640 and 1645 local time. Therefore, General Armstrong, who had flown to Eielson aboard one of the KC-97s, would approve start of the mission when meteorological data signaled clear weather in the Siberian region of interest. Regrettably, clear weather was not the order of the day-or of the week. Bad weather dogged the northern latitudes for two weeks. That allowed more than enough time for the crews to become thoroughly familiar with their respective assignments and routes. Finally, on the evening of October 14, forecasts called for favorable weather, and Armstrong gave us the "thumbs up" for the mission on the next day.

The Mission Executed

On Wednesday morning, October 15, after sunrise, Project 52 AFR-18 began with departure of two KC-97s. One hour later, Pat Fleming and I followed them into the air in the B-47s and in the area of Point Barrow, Alaska, took on full loads of fuel. Because both B-47s remained fully operational at this time, we proceeded with the mission as briefed. Fleming and his crew flew to the communications area over the Chukchi Sea, and took up station in a racetrack pattern. Now maintaining radio silence, our crew continued on course past Wrangel Island, located some one hundred miles north of Siberia, then turned southwest toward the Soviet coast. We made landfall close to noontime, swung south for a short period, and then turned eastward and flew back toward Alaska, through the heart of Siberia. In this fashion, we hoped to disguise our presence and appear to Soviet ground control as if we were a friendly, though unidentified, aircraft approaching from the western USSR. The weather, which had been bright and clear throughout the flight, changed as we crossed the coast into Siberia and turned on the camera. Beneath us, about two-tenths scattered clouds appeared, and occasional haze at the ground obscured photography of the surface for the remainder of our flight over Soviet territory.

By now we had burned off enough fuel and the bomber became light enough to be flying above 40,000 feet and well over our normal cruising speed, at approximately 480 knots true. We had finished covering two of our five targets, taking radar and visual images, when warning receivers on board announced that we were being tracked by Soviet radar. Sitting in the rear seat behind me, Ed Gunter was alerted to be ready for a possible encounter with MiG-15s, which we knew to be stationed in the area. Ed swiveled his seat 180 degrees to the rear to control the bombers only defensive armament, the GE tail guns. A few minutes later he advised over the intercom that he had Soviet fighters in sight, below and to the rear, climbing desperately to intercept us. Now identified as a hostile intruder, I broke radio silence and notified Pat Fleming and Lloyd Fields, still orbiting off the coast in the backup B-47, of our position and situation. In case events went badly for us, at least others would have an idea of what happened. Gunter kept his eyes on the fighters, but they had apparently scrambled too late. Because of our altitude, speed, and position, at least this flight of interceptors could not overtake us. The tactic of surprise had worked, though we worried, with our position and heading known, other jet fighters ahead might already be airborne and climbing to altitude to make an interception. Moreover, we had yet to over fly Provideniya-home to the MiG regimental headquarters.

We completed photographing the three remaining targets without encountering any more fighter aircraft, perhaps because we changed course from time to time, or perhaps because the Soviets simply did not have large numbers of inter-

ceptors stationed in the area. We continued eastward at altitude, passing over Egvekinot, then over Provideniya, and turned northeast, exiting Soviet territory at the coast of the Chukotskiy Peninsula. Across the Bering Strait we encountered the welcome sight of Alaska's Seward Peninsula and flew straight into Fairbanks, landing at Eielson well after dark. A few minutes behind us, Pat Fleming's backup B-47 touched down. Altogether, the mission spanned seven and three-quarter hours in the air, while the primary B-47 had made a 3,500-mile flight and over flown some 800 miles of Soviet territory. Technicians immediately took the exposed film to the photo lab for development and to make duplicates prior to aerial shipment to Washington D.C. (The photographs, though limited by cloud cover, proved valuable. Dino Brugioni, a photo-interpreter at the Central Intelligence Agency, recalled analyzing those taken of Provideniya during our flight.) Needless to say, General Armstrong was well pleased. As for the Russians, we learned from intelligence officers on Thursday morning, October 16, that intercepted messages, revealed the Soviet regional commander had been sacked and that a second MiG regiment was to be moved into the area. A few hours later, Ed Gunter and I boarded our B-47B and flew nonstop from a cold and damp Eielson AFB, Alaska, to a warmer and sunnier MacDill AFB in Florida. Until the records were declassified some forty years later, we remained under restrictions that prevented our discussing any aspect of this most secret mission.

Afterward

Six months after this first Presidentially approved Cold War overflight of Soviet territory, in April 1953 in a normal rotation of duty; the Air Force reassigned me to Headquarters SAC. One day not long after arriving, I was summoned to the CINCSAC's office. When I entered, General LeMay rose and came around the desk, closed the door, and without a word pinned on my blouse a Distinguished Flying Cross. When he saw my puzzled expression, he flashed a very slight and very rare smile, and he said, "It's secret."

A year later, on June 23, 1953, the Air Staff presented a special intelligence briefing for the new Secretary of the Air Force, Harold Talbott, who had been appointed by President Dwight Eisenhower and recently confirmed by the U.S. Senate. The briefing summarized "deficiencies in our knowledge of Soviet [military] strengths and purposes which imperil the security of the United States." It included examples of recent attempts to acquire intelligence, including our flight:

> Perhaps the most significant demonstration thus far of our reconnaissance capability was a recent overflight of Northeastern Siberia. Two camera-equipped B-47s, utilizing air-to-air refueling, were authorized to over fly the

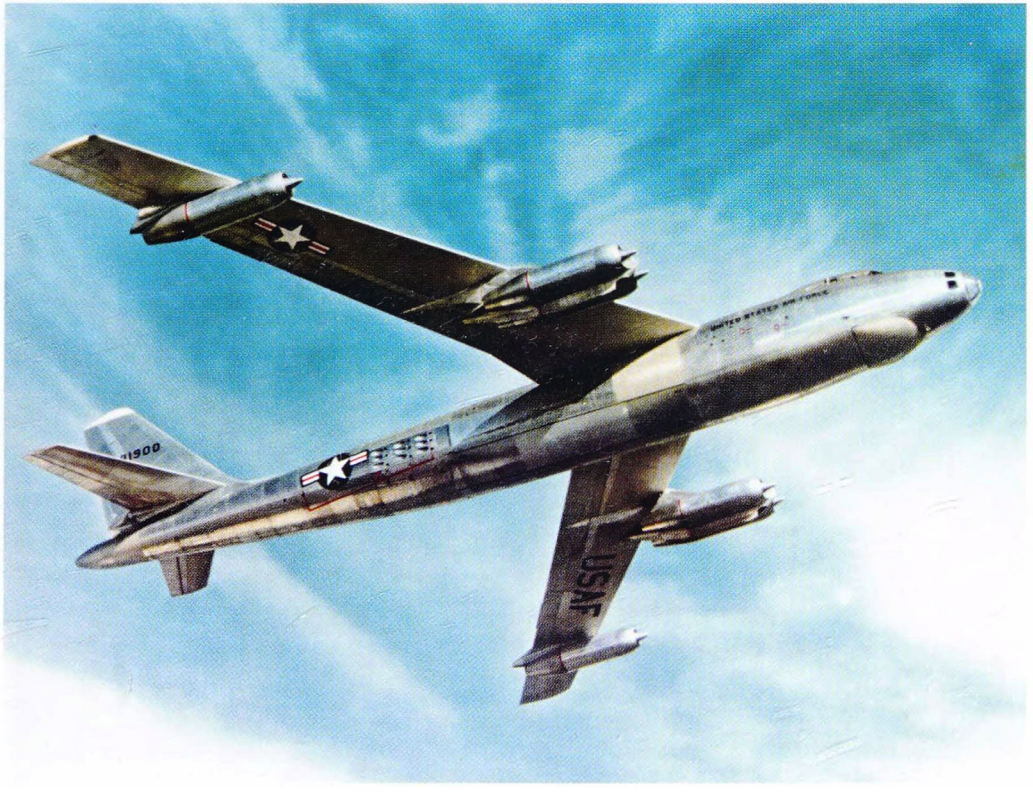
A 55th SRW RB-47H (s/n 34284) with the ALD-4 reconnaissance pod.

An EB-47E (TT) of the 55th SRW used to collect telemetry data and communications at Soviet Ballistic Missile launch sites.

A Plattsburg based B-47E (s/n 532351) prepares for a flight to Thule AFB, Greenland.

A B-47E (s/n 520236) at McGuire AFB in 1959.

Close up of a B-47E refueling receptacle.



The first "A" Model B-47 (s/n 91900) in flight.

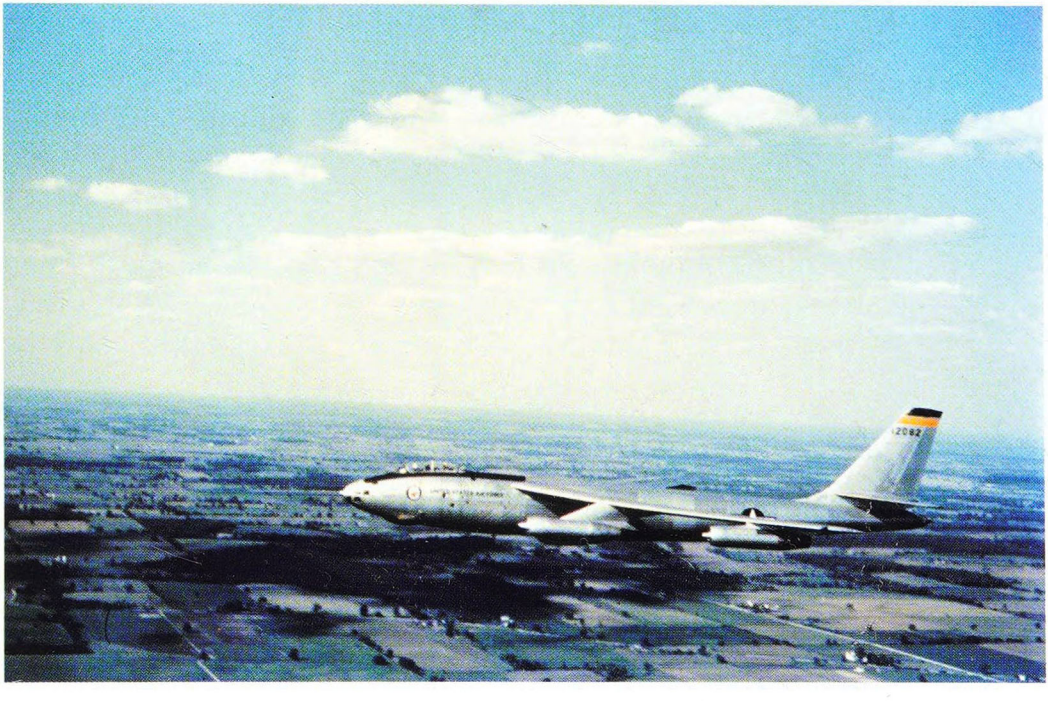
B-47B (s/n 12120) *"Sweet Marie"* at Naval Weapons Center, China Lake in 1965.

Preflighting a B-47B of the 306th BW at MacDill.

Crew performs preflight check of B-47B at MacDill.

Air and ground crew of a 306th BW B-47B.

Formation of 306th BW B-47B's.



A B-47B (s/n 12082) of the 306th BW based at MacDill AFB, FL.

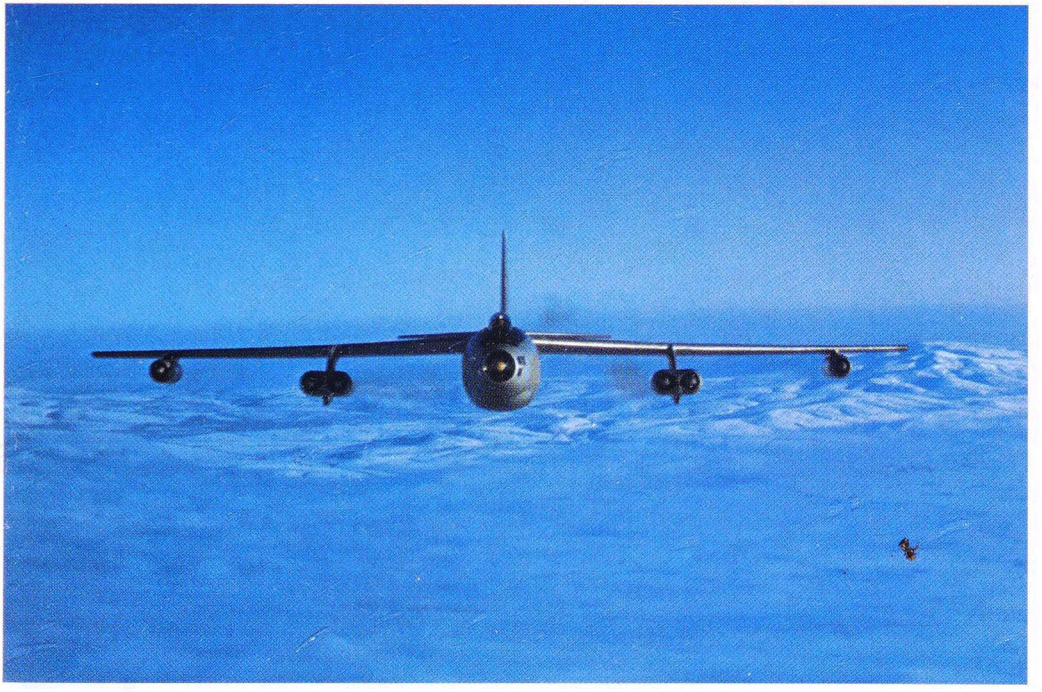
A lone B-47E (s/n 36244) on display during an open house

A B-47E (s/n 12383) of the 306th BW returning to MacDill AFB, FL following a Reflex Alert in Morocco.

An Emergency War Order (EWO) loaded B-47E on alert at Ben Guirer, Morocco.

Copilots view of air refueling with a KC-97 tanker.

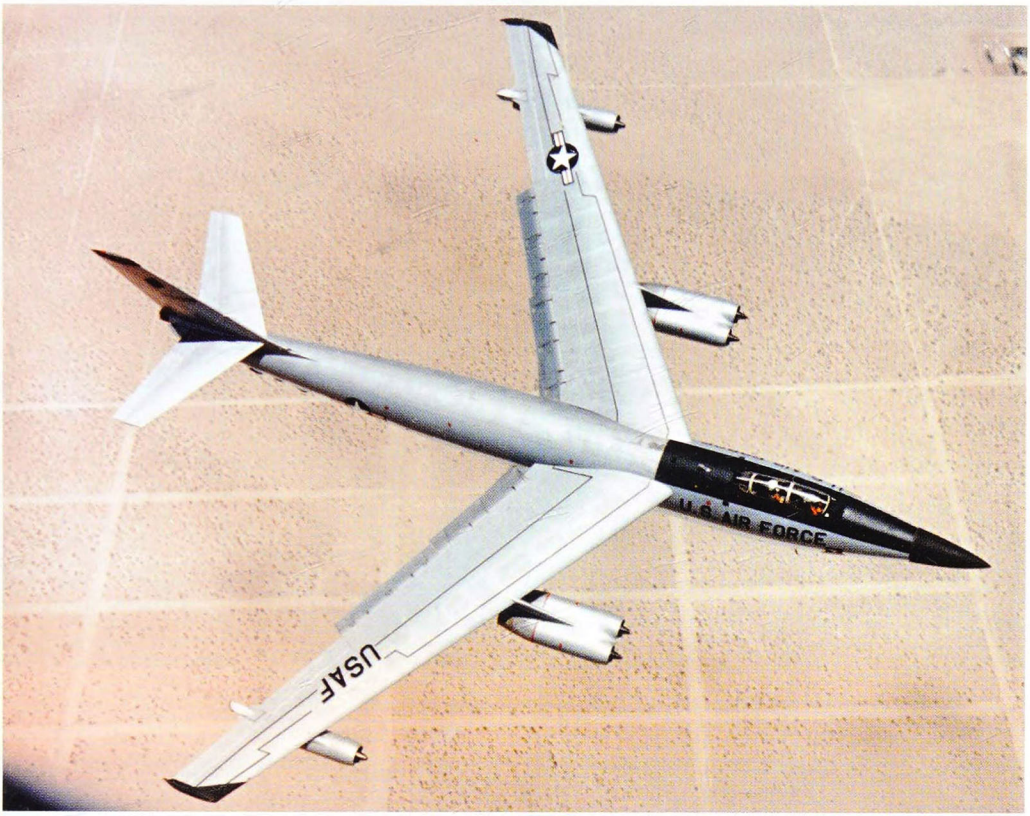
A B-47E of 100th BW at Pease AFB, NH.



The clean lines of the XB-47 can be seen in this photograph.

A WB-47E (s/n 12390) assigned to MATS.

Aircraft Commander of a WB-47E at Ramey AFB, Puerto Rico.



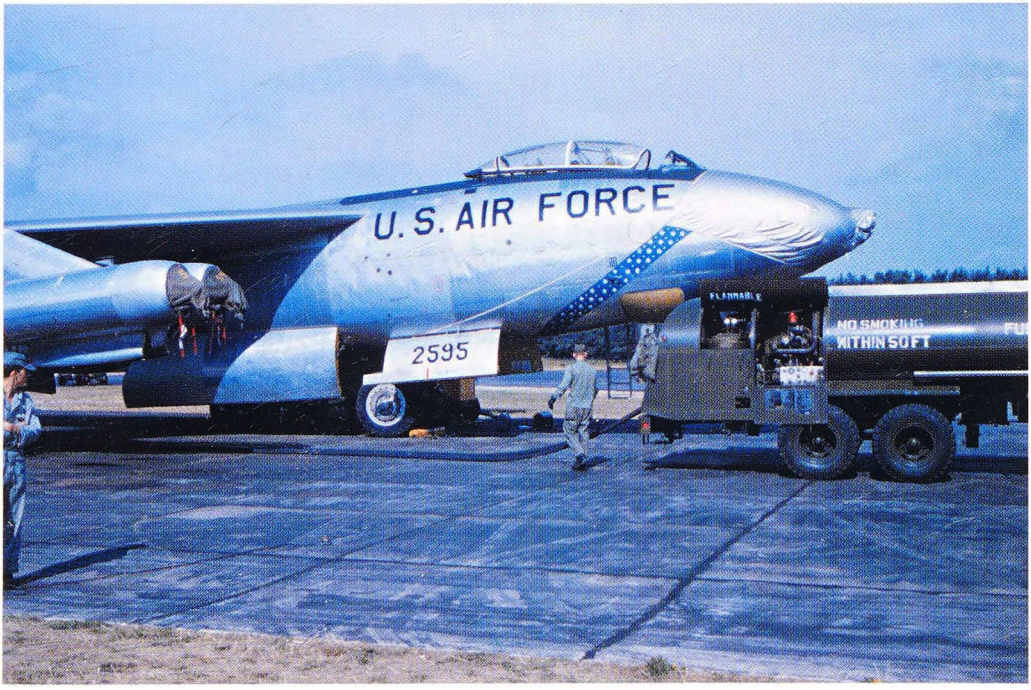
The last flyable RB-47H (s/n 34296) was fitted with an F-111 nose cone and was used as an avionics test bed during the early 1970s.

A B-47E (s/n 2463) of the 98th BW at Lincoln AFB 1956.

B-47E (s/n 34231) of 100th BW at Pease AFB 1964 open house.

B-47E (s/n 2341) flying over the Rocky Mountains.

B-47E (s/n 2327) with white anti-flash undersurfaces.



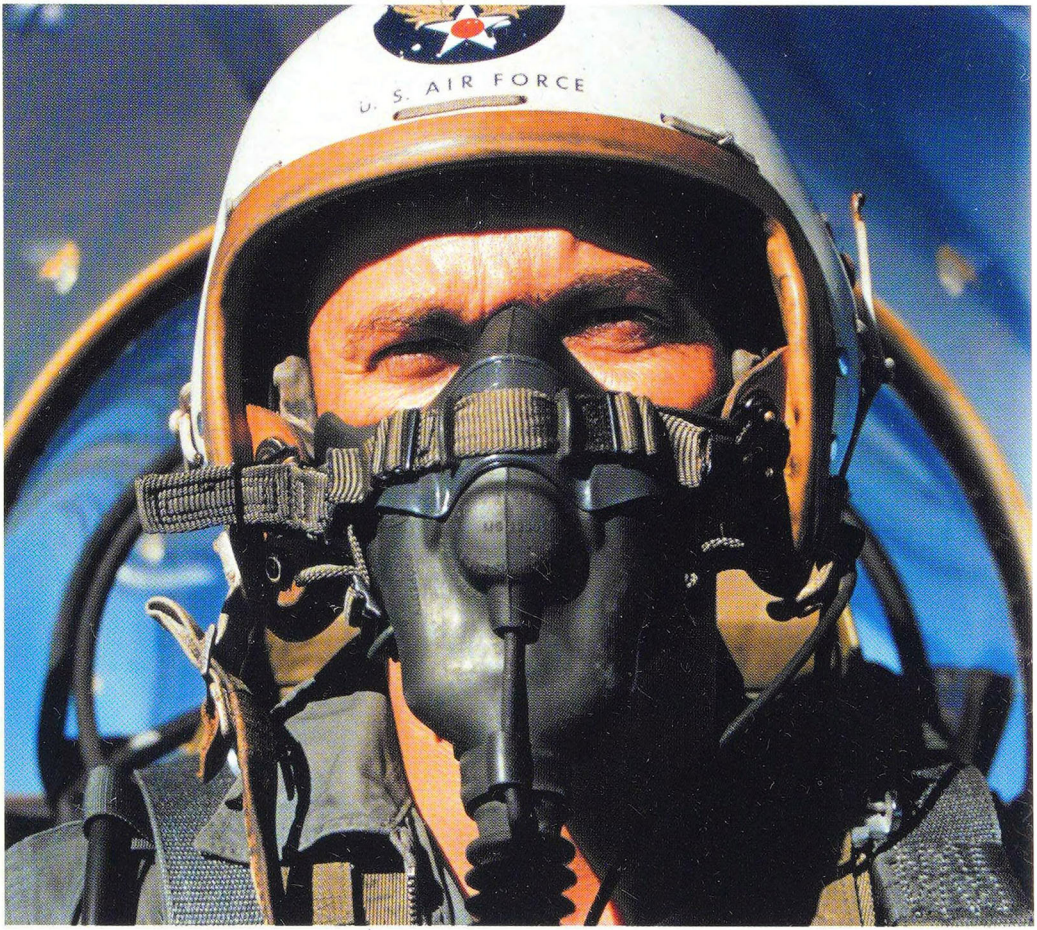
Refueling # 595.

B-47 Ground Crew.

B-47E undergoing routine maintenance at Greenham Common in 1957.

Formation flight of 40th BW B-47E's.

40th BW B-47 Es on alert at Greenham Common in 1957.



40th BW Pilot Robert Hanaway's self portrait.

CHUKOTSK peninsula, the nearest Soviet territory to the continental United States. This 3500-mile flight was made in daylight without incident. Valuable radar data as well as confirmation of other intelligence on suspected installations were acquired. Conventional photography was limited by cloud cover.

The Air Staff briefers concluded with an urgent request for a change in national policy that "will permit ... over flights of Soviet-controlled territory with an absolute minimum of delay. President Eisenhower indeed did change national policy in late 1954, after another B-47 was nearly shot down on a similar reconnaissance mission. To conduct these Presidentially authorized over flights, he approved construction of the Lockheed U-2 and further tightened security restrictions. The Air Staff team could not have imagined in 1953 that this change in national policy made seventeen months later would remove the Air Force as the controlling agent and operator, and instead make the service a partner in a super-secret project directed by the Central Intelligence Agency.

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B-47 Flight From Guam to Sidi Slimane, Morocco

By Lt. General James V. Edmundson, USAF (Ret)

In 1957, I was Deputy Director of Operations of The Strategic Air Command. Major General Robert Terril was Director of Operations and my boss. In August of that year, I was charged to conduct a visit to SAC units deployed overseas. This included a unit on temporary duty in Guam and three bases in Morocco, North Africa where SAC B-47 units had aircraft stationed and standing alert. The visit was made in a B-47 and included one flight of particular note from Guam to Sidi Slimane, Morocco. The flight took twenty-three hours and in my airplane, I carried a gift of fresh tropical fruit and a note of warm regards from the Governor of Guam to the King of Morocco. At the time, SAC had tanker aircraft (KC-97s) deployed on a global basis and in position to support this flight during their normal training activities.

At the time, this flight was the longest point-to-point flight ever made in a B-47. To my knowledge, that record still stands.

On 11 August 1957, we took off from Guam early in the afternoon. Since it was August, the weather was hot and in order to get airborne, we took off with less

than a full load of fuel. A KC-97 from Guam had taken off ahead of us and we rendezvoused over Guam and topped off our tanks, prior to proceeding on our flight.

The flight leg to Japan was uneventful. We met a KC-97 out of Yokota over Japan and we took on a full load of fuel and headed for Alaska. It grew dark soon after our refueling, but it was a short night. Being summer, the days were long and nights were short in the Northern Hemisphere and we were at high altitude and flying eastward which speeded the passage of local time zones.

Soon after sunrise, we rendezvoused with two KC-97s out of Eielsen AFB. I took on all the fuel the first tanker could give me and then moved over to the other one and continued to refuel until I got a pressure disconnect.

From there, our flight was across northern Canada, at about the latitude of the Distant Early Warning (DEW) line. It was a short day and just as the sun was setting, we rendezvoused with a SAC KC-97 out of Goose Bay, Labrador, filled our tanks and headed out across the Atlantic.

It was still dark when we arrived at Sidi, and the tower was expecting us. The sky towards the east was just beginning to get pink when we landed. We were heavier than normal for a B-47 returning from a mission with empty tanks, but we greased it in hot for a normal landing.

The total time of flight was twenty-three hours, although we had seen two sunsets and were watching our second sunrise as we taxied in. The airplane flew like a bird all the way and there were no maintenance write-ups. It was a long time to be strapped in one saddle and to live inside an oxygen mask, but in a B-47, it was a pleasure. If I had one thing to be proud of about the flight, it was hitting five tankers without an inadvertent disconnect.

Operation Redwing #1

By Lt. Colonel Robert H. Ottman, USAF (Ret)

As one of the few who have had the experience of participating in the testing of multi-megaton weapons, I thought that it might be of some interest to fly with me and my crew in a B-47 as I recount some of the excitement and hazards that go with such testing. My involvement in the testing of the multi-megaton weapons was done in Operation Redwing in the Pacific Proving Grounds in 1956.

This draft of my experiences on Operation Redwing will be included in the archives of the 301st Bomb Wing, Barksdale AFB, LA. It's a part of the history of that organization which dates back to 1942 and it's participation in World War II.

My part in the testing of "high yield" weapons as a member of the 301st Bomb Wing pales in comparison to the real heroes of the 301st BW.

The account of the experience follows.

Eniwetok Atoll – 1956

In early 1952, following the famed B-36 and prior to the B-52, the main trust of the Strategic Air Command, (SAC) lie in it's new, first of a kind all jet bomber, the B-47. This highly publicized aircraft was now the prime delivery vehicle for SAC's nuclear capability as it pertained to nuclear warfare with the Soviet Union. Because of the numerous SAC bases scattered throughout the United States, it was felt that a test of the survivability of both the aircrew and the aircraft following the delivery of a high-yield nuclear weapon should be made at the earliest practical date. While some initial testing of aircrews and aircraft had been done in the Pacific Proving Ground, going back to 1946 with a live drop of an atomic device at on Operation Crossroads, none had specifically been focused on SAC's new "nuke" delivery vehicle, the B-47. This opportunity now became a reality with the programming of high-yield thermonuclear devices to be tested during the period of May 1956 – June 1956, on a project called Operation Redwing. These tests were to be conducted on the Eniwetok and Bikini Atolls, the location of previous nuclear testing. The "yields" of these weapons were projected to be in the multi-kiloton to 14-megaton range. By comparison, most will recall the atomic bombs dropped on Hiroshima and Nagasaki, although devastation was great, were only in the 20-40 kiloton range.

To support this requirement for the initial testing of the B-47 and aircrew, the 301st Bomb Wing at Barksdale AFB. La. was tasked to provide three combat ready crews along with maintenance teams to begin preparation to deploy to Eniwetok for Operation Redwing, which was scheduled to begin in May 1956.

My crew, along with two others, was designated as an Initial Bomb Damage Assessment (IBDA) Element, which through specialized equipment could evaluate the weapons effect on both the aircrew and the aircraft at the same time, and with some highly technical photographic equipment, assess the damage from the detonation on the ground.

In preparing for this deployment, there was an additional factor that we, the flight crew, had not fully anticipated. This was the length of the runway at Eniwetok was around 5,000 feet with no over runs. In other words, it went from one side of the atoll to the other with only water at each end. The runway at Barksdale was 12,000 feet, so for rehearsal purposes we utilized the 1,000-foot markers as guideposts to simulate the runway at Eniwetok.

Now, the B-47 is known as an aerodynamically "clean bird." In other words, it has very little "flat plate" area known as drag. Anyone having flown the B-47 is well aware of this characteristic. However, after a couple of weeks of practice, we all felt we could handle the short runway with no problem. We would be landing with a minimum fuel load of only 5,000 pounds, which would be sufficient for at least three go-arounds. Hopefully, the weather would cooperate, as an alternate base was not in the picture.

After leaving Barksdale, we picked up a couple of tankers, one off the coast of California and the other after leaving Hawaii. They were more than happy to "pass the gas" and wished us a good trip to Eniwetok indicating that this lonely atoll in the Pacific would not be their choice of assignments for the next three months.

We arrived at Eniwetok with a few pounds more of fuel than planned so utilized the bonus to burn off fuel by shooting several touch and go's. After landing, we checked in at the Task Force Headquarters where we received our initial briefing and assignment to quarters. While not palatial, these "tin hooches" were posh compared to what I would find ten years later in DaNang, Vietnam. As we soon found out in the week or two prior to the first shot, it was rehearsal after rehearsal in the Bikini test area where our RN's (Radar Navigators) perfected their orbiting techniques on radar "reflector" targets to insure that the simulated timing of our release point would coincide precisely with the "countdown to blast" with the Command Control Ship. If we were not within five seconds it was an automatic abort, as a deviation beyond the five-second window would place our aircraft and crew in a highly dangerous position. The numerous rehearsals to perfect this procedure paid off as our RN's were always able to place our aircraft in the drop zone within one or two seconds of the Command Ship countdown.

At this time, let me clarify our bombing procedures, which must simulate as closely as possible the actual drop of a live weapon. Of the three aircraft in our element, two would orbit over the target area with a 2,000-foot separation, one orbiting to the right, the other to the left. The third aircraft would be in orbit approximately twenty-five miles from the target area to replace one of the primaries if needed. Our simulated bombing altitudes were normally within the 37,000–40,000 foot range. For accuracy, all shots with the exception of two were "tower" or "barge" shots. In other words, the device was placed on either one or the other with a "radar reflector" for the RN to get a radar fix on. As accuracy during these tests is highly critical, all shots must be detonated at precisely the right time to accommodate the array of instrumentation collecting the data. Thus, airborne live drops might be more spectacular from the media standpoint, but as I will show in a moment, lack the high degree of accuracy required to properly evaluate the results of the detonation.

This lack of accuracy with a "live drop" from an aircraft nearly turned into a disaster when the highly publicized B-52 from the Sandia Laboratory at Kirtland AFB, NM dropped a live megaton bomb on the second shot of the series called Cherokee! Unfortunately, the RN for some reason or other decided to make a visual drop using the optics rather than utilize the reflector on the target to drop by radar. This lead to a misidentification of the target that resulted in a premature release of approximately ten seconds and needless to say, it came as a complete surprise to not only the Command Control but also to some fifty aircraft involved in the test. Several aircraft received damage, including mine, which suffered a ruptured "Q" spring, and balance bays, which provide the artificial feel for the elevators. However, all aircraft were able to return to Eniwetok without further incident. This mistake, by itself, was proof enough that live drops are not safe or practical for testing purposes, thus the "tower" and "barge" controlled shots.

As I mentioned earlier, the premature "drop" by the Sandia B-52 came as a total surprise to all of the aircraft on this specific test. When I hear the Command Control Ship call "Breakaway – Breakaway," the code word that something had gone wrong and for all aircraft to exit the detonation point immediately, I started my "breakaway" maneuver which was a sharp bank at .81 mach in an attempt to make at least a 120 degree turn and get my wings level and tail to the blast as soon as possible. At this point, the last thing I wanted was to be directly over the weapon when it detonated, which could have been catastrophic. However, we didn't quite reach the optimum position, as midway through the turn the weapon detonated, a 2.3-megaton charge that engulfed our aircraft with the "flash." Obviously, we had not rehearsed for this situation so there was no way that I could reduce the "flash blindness" which followed and would last for approximately thirty seconds. My copilot, fortunately, had the foresight to put on his goggles as soon as we started our breakaway maneuver, something that no doubt saved our lives because he informed me that we were in a sixty degree bank descending rapidly at .87 Mach. As the B-47 will buffet at little over .81 Mach, we were having severe buffeting and although leveled out could not control the aircraft. This left us only two options: either eject at night into the shark infested waters of the South Pacific or drop the gear hoping we could reduce the airspeed enough to gain control of the aircraft. The latter was worth trying which we did, and ultimately got the aircraft under control after loosing 5,000 feet when the "shock wave" hit with a jolt that questioned whether the wings and tail sections were still part of the fuselage. It was at that time that we received the damage to the elevators that I related earlier. In my case, landing a B-47 in the dark of night, in a rainstorm with six inches of play in the elevators on a short runway is not conductive to a long and healthy life in the Air Force. But, thanks to a superb GCA (Ground Control Approach) opera-

tor and clever copilot who popped the "brake chute" just prior to touchdown, we slid to a stop before going off the end and taking a dip in the lagoon.

Now, for further elaboration about our flight and cockpit procedures during the "shot." I've already covered the criticality of the orbiting process, which requires my RN to place the aircraft over the simulated bomb release point within seconds of where the Command Control says we should be. The entire control of the operation is the main function of the Command Control Ship, a naval vessel, positioned outside the critical blast zone. The Command Ship "countdown" to detonation is what every aircraft in the array sets their watch by, probably the most critical aspect of the shot itself. My RN, who has now positioned our aircraft within the five-second window of the simulated "drop point," now tells me to start my "breakaway" maneuver, which is based on his pre-computed ATF (actual time of fall) for the weapon. At this time, I release the auto-pilot, go manual and "tuck it in" at .81 Mach for an optimum turn of at least 120 degrees, which is designed to have me roll out, wings level and tail facing the blast. This is done in order to receive minimal damage to the aircraft and to provide a stable platform for the photographic coverage of the blast. Ideally, I would now have the wings level, tail to the blast and the ten second to blast countdown by the Command Control would place one hand over my eyes, my only protection from the "flash" other than the "flash curtains" which, at that time were nothing more than a heavy canvas material. Hopefully, within fifteen to twenty seconds, the flash would have diminished enough to permit me to again take over manually. To every pilot in our element, "flash blindness" was the most critical of all of the weapons effects as during this period of blindness, the aircraft was literally without a "driver." To say that with my hand over my eyes I could see the bones in my hand is not fiction. I believe scientists' rate a nuclear flash as about ten times brighter than the sun and I believe it.

At the five second "countdown to blast," the copilot also has specific duties. He now places what looks like welder's goggles over his eyes, which totally blanks his vision. However, at blast time, the "flash" affords him total visibility with which to record the instrumentation within his cockpit as it pertains to all the weapons "effects," i.e., "heat/thermal – overpressure" and gust or "shock-wave" impact. Also, in the event the aircraft goes into an unusual position due to the pilot's inability to see during the fifteen to thirty second "flash," he is alert to respond to whatever correction of the aircraft's attitude is needed during this critical time period. Fortunately, we only faced this predicament on one occasion, which was during the early release by the Sandia B-52 when my elevators were damaged. I covered the incident earlier.

In addition to the instrument readings, which the copilot recorded, we also had a spectrum of various colors from black, blue, purple, red, green, yellow and white painted in stripes on the underside of the elevators. Upon landing, the effects of the heat from the weapon, several thousand degrees centigrade, was obvious, as all of the colors of paint with the exception of white, appeared to have been scorched with a blowtorch. Obviously, this is why all SAC aircraft delivering "nukes" at that time were painted "thermal white" on the underside of the fuselage, wings, and empennage.

The effect of the "shockwave," was interesting, as we had all been forewarned that with multi-megaton weapons the empennage could be blown off if the optimum turn of 120 degrees was not attained during the "breakaway" maneuver. While the shock wave did give us a pretty good jolt, it was not as severe as some CAT (clear air turbulence) I've encountered. It did loosen up some rivets, but nothing serious.

Once the flash had dissipated and the "shock wave" had hit, the flash curtains were retracted and we had the unique experience of viewing at close range, the beauty of this awesome, multi-colored mushroom cloud which by now is 60,000 feet and still growing. It's hard to believe that something this awe-inspiring could cause the horrible destruction it was designed to do. As most of the shots were at night, this spectacle of the multi-colored mushroom cloud became even more spectacular.

In summary, let me evaluate individually the "effects" of high-yield thermonuclear weapons as it pertains to both my crew and the aircraft. As stated earlier, this was the primary purpose for our participation in the tests.

In order of importance to the aircrew, "flash blindness" was a factor that apparently was underestimated by SAC Headquarters, as the "flash" curtains were totally ineffective, which left the aircraft literally "pilot less" for a period of fifteen to thirty seconds, depending on the "yield" of the weapon. Our recommendation to replace them was implemented immediately.

"Shockwave" or "gust velocity" could be a very serious and critical "effect" from the weapon, if the aircraft had not attained its optimum position of a minimum 120 degree "break-away" turn with a level aircraft and tail to the blast. The damage to my elevators due to the premature release by the Sandia aircraft was a direct result of being in the wrong attitude at the wrong time.

"Overpressure" was an "unknown" and difficult to anticipate and although it did "crush" the bomb doors and pop a few rivets, was not considered a critical factor as it pertained to the delivery of the weapon.

The "effects" of the "thermal or heat" was not noticeable in the cockpit, but as described earlier, would definitely be a serious consideration if the underside of the aircraft were not painted with white "thermal paint."

A surprising conclusion by our aircrews was that the weapons "effects" between a one-megaton and fourteen megaton were not significantly different, other than a longer "flash" period for the larger weapon.

As to any health hazards, to the aircrews, the radiation factor was obviously one of prime consideration. Radiation dosimeters were carried by all crewmembers and documented following each sortie. In spite of the fact that most of the crew members, including myself, have experienced an unusually high number of carcinomas and other types of skin cancer, neither the Nuclear Defense Agency nor the Veterans Administration have drawn any conclusions as to whether our degree of radiation from the tests has had a detrimental effect on our health. To further summarize, quoting from an official document published by the Defense Nuclear Agency; "The REDWING 17 detonation nuclear weapons test series was held primarily to test high-yield weapons of the thermonuclear category that could not be tested in Nevada." Numerous technical experiments were carried out in conjunction with each of the detonations. These experiments measured the yield and efficiency of the devices and attempted to gauge the military effects of the explosions.

In my case, and aside from the experiments of the Defense Nuclear Agency, I view this once in a lifetime experience of not only testing but also viewing the most powerful weapons ever conceived by any country in the world akin to the Seven Wonders of the World. This could certainly rank up there as the Eighth!

Operation Redwing #2

By Colonel Thomas M. Sumner, USAF (Ret)

Effects on an airplane by the weapons dropped were of no consequence to bombers of World War II. Weapons were small compared to distances between the airplane and detonation. With the advent of atomic weapons this effect became significant. Atomic bombs dropped on Hiroshima and Nagasaki caused shock waves large enough to create alarm about their effects. Testing began on Operation Crossroads in the Marshall Islands in 1946. Drone B-17s were flown in those tests to determine these effects. The XB-47 was flown on Operation Greenhouse by Bob Halliday, Jim Bauer, and Ted Jersick in 1951. Two B-50s piloted by Jack Warfield and Fred Hughes with Charlie Gilmore and Ed Little as their navigators also participated. A B-47B crewed by Jim Bauer, Gene Deatrick and Gilmore did the first testing with the new big weapons using atomic fusion to create the explosions on "Operations Ivy" and "Castle" in 1954 and 55.

Because the effects were unknown the engineers used conservative methods of predicting the damage to an airplane. The airplanes were exposed to very high levels of shock, heat and crushing but the results indicated it was possible to be closer to the detonation and receive higher loads than experienced. Thus, the engineering conservatism was reduced for the next test force airplanes in order to obtain maximum allowable inputs of these forces.

The series of tests, Operation Redwing, in 1956 gave the opportunity to obtain more data not only on a B-47 but also on several new models of aircraft not yet exposed to weapons. The Wright Air Development Center (WADC) was again assigned this task. The Flight Test Division then directed by Ken Schultz furnished the airplanes and flight and maintenance crews. The Aircraft Laboratory provided engineering supervision and test engineers. The force was composed of the following personnel:

B-52B Charlie Anderson, pilot and force operations officer; Gene Deatrick, copilot; Charlie Gilmore, lead bomb/nav; George Lewis, assistant bomb/nav; Fred Doherty, crew chief. B-47E Tom Sumner, pilot; Claude Brown, copilot and force maintenance officer; Joe Dean, bomb/nav; Ivan Clower, crew chief. B-66 Ralph Robinette, pilot; Ed Little, bomb/nav. B-57 Willard Mitchell, F 101 Johnny Apple, F-84F Bud Evans, F-84F Charlie Kitchens.

Redwing demonstrated the first operational "Hydrogen Bomb" plus fourteen high yield experimental devices. The yields varied from approximately _ to ten megatons (MT) of TNT equivalent. Higher yields had been created in previous tests and a test fusion device had been dropped on Ivy but Redwing was the first time an operational fusion bomb was dropped. This air delivery was to be the first in the series and the most critical for aircraft positioning.

Positioning was demanding. Being in the planned position was necessary to either survival or collection of data. If too close, severe damage or loss of the airplane and crew could occur, if too far away the effects would be too low and positioning criteria could not be verified. It was imperative the weapon be exploded at a planned time and location so the effects aircraft could be in position. With surface based shots this proved to be no problem. The location was fixed and the detonation controlled by a reliable timer. The air delivered weapon was another problem.

The crew of the Drop airplane, another B-52 from Kirtland AFB, NM had practiced dropping in New Mexico but they would only assure their drop would be within ten seconds of planned time. This variance was beyond our limits. Our positioning was based on being no more than two seconds early or late. The procedures we had developed provided for this but were based on a fixed time and location. Because the Drop B-52 crew would not guarantee anything better than

ten seconds of tolerance we modified our procedures for a varying H-Hour of up to ten seconds. With a lot of practice we determined we could adjust if we were provided the new H-Hour no later than about four minutes out on our final run. This procedure depended on the Drop B-52 providing by voice radio a count down to actual drop time starting about four minutes from the drop. We practiced this as a single aircraft many times using our test engineer to simulate the Drop B-52's count down. All WADC crews developed procedures to cope with this possibility.

The Drop crew however, practiced very little and we never had a full-scale rehearsal to insure communications and coordination would be satisfactory. The Drop bombardier, upon whom we all depended, relied almost entirely on his optical system for alignment and sighting the target rather than radar. This procedure proved to be faulty. The target, a large lighted radar reflector located on an island in Bikini atoll, could be easily seen on radar or with optics in clear weather, which was seldom the case at that time of year in the Marshall's. The B-52B, B-47E and B-66 used their own bomb/nav system for positioning. These airplanes had an additional instrument that compared the time of day with the "Time To Go" from the bomb system and presented the difference to the pilot on an instrument that enabled him to adjust speed to arrive exactly on time. It was also important that the speed be as designated and altitude and heading be within small tolerances.

All aircraft flew timing patterns to finalize their position. The Drop B-52, B-52B and B-47E flew racetrack patterns in the same direction, all other test aircraft flew patterns opposite in direction to the Drop B-52, separation was provided by altitude spacing. After bomb release the Drop B-52 was to make a tight turn of approximately 120 degree to escape the major weapons effects. All aircraft were to be positioned very close to the target with their tails toward the explosion. With the exception of the B-66 all other test aircraft were positioned by a ground generated signal produced by a system known as "Raydist." The signal was displayed on the pilot's ILS instrument, the ID-249. The pilot steered into the vertical needle for direction and adjusted speed based on the horizontal needle, keeping both needles centered was the objective.

After two attempts to drop were canceled, due to weather, the morning came when it was satisfactory. H-Hour was planned for around 0600, about 30 minutes before sunrise, to provide a dark sky as a backdrop for fireball photography to aid in yield analysis. The Drop crew was instructed to abort the drop if things did not go as planned and try for a second H-Hour twenty minutes later.

All test aircraft proceeded as planned when at about ten minutes before the scheduled drop time the Raydist system experienced a power failure and the operators were not able to provide a signal for those aircraft dependent on the system for navigation. So, all Raydist equipped airplanes were directed to abort from the

array, which was a blessing, as they would have been destroyed had they continued. Those aircraft using their internal navigation systems, the B-66, B-47E and the B-52B continued as planned.

The Drop B-52's count down to release was to contain the phrase. "SAD SACK X SECONDS." The "X" being the time remaining before dropping the bomb. There were to be about seven of these calls starting at 210 seconds before release followed by others at 30-second intervals. The final call announcing the release was the word "COMPLETE." The test crews planned to compare the time of day these calls were received with the time of day they were scheduled and thus determine any minor shifts in the H-Hour. In order to make this comparison the calls had to be understood very clearly but they were not; the calls were garbled, not at all understandable, thus the test crews could not rely on the information for determining any possible shifts in the predicted H-Hour.

When the B-66 pilot and his navigator heard the first garbled call he sensibly aborted and that decision saved his airplane and the crews lives. The B-47E and the B-52B requested clarification of the calls but the response was also garbled. So, assuming that if the Drop crew had a problem they would discontinue the run and go for the secondary H-Hour scheduled for twenty minutes after the primary. Therefore, we continued inbound trusting the drop would be as scheduled.

All the "SAD SACK" count down calls inbound were garbled except the last word, "COMPLETE." It came through loud and clear but thirty seconds earlier than scheduled. This meant the weapon would explode too early for our survival, as we would be thirty seconds too close. By this time escape by turning was not possible, all we could do was increase our airspeed and in the time remaining that was not enough to gain the distance needed for safe exit.

The weapon, code named CHEROKEE, took 54 seconds to fall before exploding in an airburst at 5000 feet above the water. During the fall a tape recorder from the command ship, located some where on the ocean, transmitted the time remaining to detonation in ten second intervals for the first forty-four seconds then in one second intervals for the last ten. These calls reminded all of us how much time we had left to live. We assumed the Drop crew made an error in navigation timing and the bomb would hit the target 30 seconds too soon.

When the bomb exploded it created a brilliant bright light and the heat was felt in spite of the thick asbestos blast curtains. The light and heat intensity increased to a maximum in about fifteen seconds. I thought our airplane was on fire and considered ordering ejection but quickly ruled that out as there was really no place to go except down into the fire ball. I decided to ride it out until I lost control, then order abandonment. Our test engineer who was riding in an aisle way between the pilot and copilot's seats had no ejection seat and would have to get out

through the entrance way as best he could, a risk he always knew existed but never expected to face.

After about twenty or thirty seconds the light began to fade, I realized we were not on fire and opened the curtains to discover, to my amazement, we were in one piece. All six engines were in place on the wing and a look over my shoulder revealed the comforting presence of the vertical stabilizer projecting upward from the aft fuselage. The B-47E was flying just fine. I had already disengaged the autopilot when we approached our Mach limit of .81, due to the increased speed I had applied. So, when the shock wave arrived I was braced for what it might bring but the input was less than what I had expected had we actually been thirty seconds too close to a five MT explosion.

Because of these indications and the fact that we were still in a whole airplane we guessed the bomb had gone well under predicted yield, which accounted for our survival but this proved to be not correct. As we learned later, the bomb had indeed provided the predicted yield of about 5 MT but hit 30 seconds early and several miles short of the target. What went wrong? Why did it not hit the target, as we believed it would when it was falling?

An investigation determined the Drop B-52 had flown a proper pattern, the navigation and timing was correct but the bombardier, not the navigator, made a mistake in target identification by aiming at a single light located on another island well beyond the target. As he neared the target he realized his error and quickly moved the telescope cross hairs to the correct target but made an additional mistake by not disconnecting the bomb system computer during the movement. The system interpreted this as a sudden increase in ground speed and automatically released the bomb early causing it to hit several miles short of the desired impact point.

The planned location of all test aircraft was tail on to the explosion so the airplane was flying away from the point of detonation, not into it. Since the Drop B-52 flew the correct flight path and my B-47E and the test B-52B were traveling in the same direction as the Drop B-52 our relative positions were as desired. The premature release of the bomb meant its point of impact though not on the intended target was at a location relative to us that was close to the desired distance from our airplanes. In fact the speed I added during the fall placed us at a greater distance from the point of explosion than was desired for the test data. All this we discovered after the investigation. During the fifty-four seconds it took the bomb to fall we did not know this but believed the impact would be on the designated target but much too soon.

The situation for the B-66 and the Raydist aircraft was different, they were all traveling in the opposite direction of the Drop B-52 and had they continued their

flight paths as planned they would have flown head on into the explosion which would have most certainly destroyed them.

This first shot of REDWING though not successful from our point of view did demonstrate a hydrogen bomb that would work. There were 14 more shots that followed CHEROKEE, all ground based explosions, precisely controlled. We got good results from those shots, most were close to predicted yield and our positioning was excellent each time. One of the shots was almost too much and nearly caused the loss of Bud Evans and his F-84F. This shot went well above its predicted yield of five MT. All test aircraft received above planned gust loads and heat. Bud's F-84F got a cracked wing spar and never flew again, he barely made it back to Eniwetok as the wing was just hanging on by the skin and other substructure.

The bomb bay doors of my B-47E were crushed inward, all six fire warning lights were triggered by the heat (this was before they were disconnected in all B-47s) and the elevator panels nearly melted. All other planes received similar damage, the F-84F being the worst.

The last shot of the series caused considerable damage to the B-52B radome and bomb bay doors. These cavities had special bracing installed for all other shots and the bracing was removed for the last event to determine if the bracing was indeed needed. The test results confirmed the need for the bracing as the doors and radome were crushed and had to be repaired.

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Flying on Fumes

By Lt. Colonel Alex P. Brewer, USAF (Ret)

The Aircraft Observer Bombardier (AOB) School at Ellington AFB, TX and Mather AFB, CA in 1951-52, put little emphasis on navigation other than basic map reading with little celestial and no radar training. The Korean conflict had created a demand for "map reading" type navigators and bombardiers, so most, including myself were primarily checked out as Bombardiers, with B-25 flights and Norden Bomb sight training. So when I was assigned as a "Nose" Nav/bombardier in RB-26's in Korea I still wasn't really doing any navigation other than map reading. After finishing my 50 mission combat tour in Korea I was assigned to the 306th BW at MacDill AFB, FL, with Colonel Mike McCoy as commander.

This was the first Strategic Bomb Wing in Strategic Air Command (SAC) to get the all-new B-47 six engine Boeing Stratojet. The B-47 had no provisions for map reading as it relied on radar (K-5), plus celestial and the old standby Dead Reckoning (DR) for navigation.

General Curtis LeMay hadn't quite given up the B-36s to retirement, so for a period, the USAF had B-47s and B-36s competing for the honors of being SAC's primary deterrent. The "Cold War" was gearing up and although the SAC Alert program was at that time not operational, extensive training was being conducted by SAC and many new Bomb Wings were being activated. The B-47s were being phased in as a replacement for the B-29s and the B-36, which was operational until 1960. Someone at SAC or Air Force dreamed up long-range (eighteen hour) missions to prove the capability of the B-47 and test aircrew endurance. These extremely fatiguing and challenging long-range endurance missions called "Reflex" (and other names by the crews), simulated strike missions against the then Soviet enemy.

After an initial checkout with squadron instructors and a few solo, (with crew) training flights, my flight crew somehow passed Standboard. My aircraft commander was a former P-51 pilot who had a very impressive war record with many combat missions over North Africa. Only problem was, he at times flew the B-47 like it was a P-51 fighter. My copilot was fresh out of training command and had no previous experience in multi-engine jet aircraft or with navigators. So, between the two pilots, my lack of experience and this unforgiving airplane it was definitely a challenge to accomplish the many training requirements of SAC to become combat ready. Fortunately I was able to master the challenges of the old "K-5" radar, which was limited to 50-mile cross-hair range and soon caught on to RBS operations and the radar bombing requirements of SAC. As a crew we were doing well and were on our way to Lead Crew status, which was a step away from Select Crew and maybe a coveted "Spot" promotion. So there I was, the only 1st Lt. Radar/Navigator on a SAC B-47 crew with bare minimum flying time and practically no navigation experience. Almost all of the other Radar/Navigators. In the wing were rated pilots (Four Headed Monsters) and the remaining Navigators. were veterans of WW II, plus most had extensive navigation experience in B-29s. So I was the "new guy on the block" and not getting much "respect." Several of the squadron navigators helped me check out, and one in particular, Major Alex Siling was my mentor, instructor and friend. (Regrettably, he was later killed when two B-47s collided in the Tampa Bay area.) Once we had met all of the basic requirements and passed our standardization check in the 367th Bomb Squadron our flight crew was deemed ready with the designation R-72.

Shortly after qualifying as Combat Ready, the OPS order came down from SAC combat operations for the 306th to execute a then classified "Reflex" training mission. The mission profile was the following: we were to take off from MacDill AFB, FL, with a Mk-6 shape (dummy weapon) on board, proceed NE to Jacksonville, FL, then eastward to Hamilton, Bermuda, then down to a position WSW of the Azores for our first refueling, then to French Morocco with another refueling, on across the southern edge of the Mediterranean to a simulated target in the city Bizerte, Tunisia (of World War II fame), then back north across the Mediterranean to a turning point at Santo Antoco on the southern tip of the island of Sardinia, then west to a turning point south of the island Majorca, on to the city of Tangier and then SW on to a landing at Sidi Slimane in French Morocco.

The lead aircraft was actually being navigated by a "Select" crew navigator so as the 5th airplane in the cell of five my responsibility was to keep up with our current position, and to basically follow the leader across the Atlantic. After the second air refueling over NW Africa, we would form in to a five unit bomber stream with ten minute separation for spacing and proceed on to the designated target. Since I was the least experienced Radar/Navigator in the flight this "follow the leader" idea suited me fine. Actually, I was probably the least experienced in SAC at the time.

After extensive briefings, mission planning and target study the day of the big flight finally arrived. So it was out to the base at 2200 Zulu (1700 local), with little sleep, for a 0000Z takeoff. Everything proceeded at a normal pace and after preflight of aircraft #516, all flight gear plus flight lunches and drinking water were put on board, we were ready for engine start. Our command post advised us that a message was received from SAC headquarters that the mission had been delayed because of weather in both refueling areas for twenty-four hours. So the Flight Surgeon issued sleeping pills and "Downers" to all crewmembers. (This was common practice at the time.) So after getting back home, and taking the prescribed medication and into a restless sleep, the phone call comes from the SAC command post that they want us back to the base because SAC has changed the twenty-four hours to twelve hours. The mission change meant that instead of flying the Atlantic at night and having celestial with many stars available for observation, that the day flight over the Atlantic would force us into using only 1celestial body, the sun (the moon was not visible) for a navigation aid. So it is back to flight operations and more flight planning. Most everyone was groggy and half asleep, so the friendly Flight Surgeon is now issuing "Uppers" to wake us up. By this time, because of the pressure, stress and drugs, most of the flight crews looked like "Wild Eyed" zombies.

After refiguring and adjusting the flight plan to allow for changes in the high altitude predicted "jet" winds, loading the aircraft with flight gear and "Gourmet" flight lunches we started the usual preflight checklist. As we were #5 in the cell, we were starting engines after #4, which put us at the end of the line for taxi and takeoff. Fuel was a concern, so all tanks had been topped off and the plan was to get us all started and launched as rapidly as possible. After airborne we would regroup by the time we reached Jacksonville and then proceed in the planned five airplane cell. We found out later that the ground support personnel had been issued their share of Downers and Uppers so the whole operation was pretty well a disaster waiting to happen and certainly qualified as a four alarm "Chinese Fire Drill." In any event, when it came time for our engine start, the jet engine "start" cart ended up catching on fire and only the quick actions on the part of the ground crew averted a catastrophe. Needless to say, I as the navigator had that port side entrance hatch open and was out on the ramp directing the fire fighters by the time the A/C and copilot reached the ground. The A/C claimed it took him so long to get out of the aircraft because he was looking for me.... Sure!

There was no damage to the aircraft, but by the time the ground support maintenance had topped off our fuel, got a spare "start" cart started and had us restarted, our cell of four airplanes had already reached Jacksonville and were well on their way to North Africa. Now we were thirty-nine minutes behind the others, so instead of launching us in with another of the following cells, the commander made a (not so bright) decision to launch us solo. After removing the safety pins from the ejection seats, completing the pre takeoff checklist and taking the active runway we were ready to roll. MacDill tower gave us permission to take off and with the 13,000-ft. runway at MacDill, AFB, even with water (injection) assist on the General Electric J-47 engines; takeoff was an experience to be remembered. The J-47s produced 7,200 pounds of thrust, so with all six "burning" at maximum power we were generating 43,200 pounds of thrust to launch 206,700 ponds of airplane, "dummy" weapon and fuel off the ground. Aircraft #516 lifted off runway 04 just short of the 13,000-ft. marker. We had the sensation that we were dragging our tail when we cleared the NE fence and climbed out with maximum power over Tampa Bay and the residential areas of Davis Island located on the far side of the bay. (Our home was on Davis Island, so my wife Dora Lee heard us climbing out overhead as we passed by.) Climb out was the usual staggering climb with the Mk-6 shape on board, all tanks full of JP-4 and three "Wild Eyed" crew members plus a staff passenger who was going along to see what Morocco was like. The MacDill peninsula was swampy and a haven for very aggressive salt water mosquitoes that seemed oblivious to the insecticides that maintenance always sprayed in the cockpit areas prior to flight. We deviated slightly from the checklist and delayed pres-

surizing the cabin until 20,000-ft. so as to kill off the ever-present "attack" mosquitoes, as lack of oxygen assured us of a sure kill. After leveling off and pressurizing the cockpit area, radar navigation to Jacksonville was routine, and then with a good departure radar fix at coast out just north of Jacksonville, Florida we pressed eastward. With sun lines, pressure pattern and a little air plot to keep us on course, I of course was looking forward to getting another positive radar fix from the landmass at Hamilton on the island of Bermuda.

Approximately 300 miles SW of Bermuda we were in moderate to severe turbulence and shortly thereafter approached a line of thunderstorms that stretched across our planned course from the NW to the SE. We decided to climb as our only option rather than penetrate these big returns which were building up above 38,000-ft. Our planned altitude at the time was lower so the fuel consumed threading our way around and climbing as well as maintaining this high altitude was a sacrifice we did not want or need. As we were topping what appeared to be the lowest storm cell of the group, the entire airplane lit up like the Times Square "Ball" and with a loud bang and shudder we had experienced a lightning strike. I looked back over my left shoulder and our staff passenger who was in the fourth man seat, which was a non ejection seat, had the look of a petrified "green" wild man. The lightning strike had shut down my "K" bomb-nav system and my main circuit breaker panel had more popped circuits out than were in. The A/C and copilot had major electrical failures and lost part of their instrument panel including the use of the autopilot and some engine monitoring instrumentation on #6, our most starboard engine. Loss of the autopilot meant that the two pilots had to manually fly the airplane for the next thirteen hours, and since the B-47 had a tendency to wander on heading (at least that is what the pilots claimed) it was difficult to maintain accurate altitude and hold a heading for Dead Reckoning.

On this early model of the B-47, the copilot was responsible for H.O. 249 computations and celestial observations. I usually did the H.O. 249 computations as he had no desk to work from and in addition, he was no mathematical wizard. His star/sun "shooting" accuracy was poor at best because he had to make observations with a hand held MA-2 sextant through the curvature of the Plexiglas canopy and his sun line observations were now further degraded by the loss of the autopilot. The later model B-47E had the Kollsmand D-2 retractable periscope sextant (with an azimuth ring) mounted over the navigator's station, which solved the problems of relying on the copilot for celestial observations. With lightning induced electrical failure, we did not have the use of Tacan, or any other navigation radio aid to help us on our way across the pond. Fortunately, we somehow still had the use of UHF and VHF radios. We pressed on and a few minutes later, when we were approximately 200 miles west of Bermuda, we were advised by radio by

"Sky King" (the SAC command post) of severe weather in the area (we already knew about the weather) and we were diverted 100 miles south of our planned course. Unfortunately, when we passed by Bermuda, with the radar inoperative I was unable to acquire the island returns on radar or acquire any decent radar fix. To add to the challenge, this course divergence took us out of range of a Navy O.S.V (Ocean Station Vessel), which could have been a navigational aid for a positive fix. With the tropical storm raging below I imagine the Navy destroyer had their own challenges to deal with. After several attempts, we were unsuccessful in raising the Navy on the radio, as I had hoped that they had a radar fix on us or at least get an update on weather, especially winds aloft.

Fuel was always a concern with the B-47 and by now, the copilot was charting us at 6,000 pounds below the planned fuel consumption line. As we proceeded to a DR position about 300 miles ESE of Bermuda, the pilots reported contrails going east several miles south of us and they insisted on jogging down and getting behind the contrails. G.O.K (God Only Knows) who made the contrails, maybe a UFO, a weather reconnaissance aircraft or some one lost in the Bermuda Triangle. They were probably a freak of weather, because when they finally got behind them, which was about 120 miles south of our planned course, the "Mystery" contrails made a big circle back to the southwest back toward Florida. The way things were going I was ready to follow them back home myself, but duty called and we pressed on.

Airborne maintenance on the old "K" radar was limited to a few fuses; circuit breakers and replacing "beer can" shaped electronic circuit "gadgets" that replaced faulty circuits. For the next two hours I was in and out of my seat resetting circuit breakers and plugging in the "beer can" components in the radar equipment rack. Somehow with a lot of determination and luck I was able to get the radar system and bombing computer fully operational. In conjunction with D.R., I have given up on pressure pattern because with radar out I had been unable to get accurate radar altitude measurements for over three hours. Because of the weather I was now relying on sun lines provided by the copilots plus Air plot. Unfortunately "Old Sol" is directly overhead which further degraded the celestial observations and we were unable to shoot and acquire a "Noon" day fix. With the weather changing so rapidly I felt that the predicted winds for D.R. and air plot were next to worthless since they were over eight hours old at that time. It dawned on me that with us moving at .72 mach, (seven miles per minute) relying on dead reckoning at 425 True Airspeed, plus course deviations, plus manual flying, plus weather, plus "Uppers and Downers," plus two pilots wanting to chase contrails, plus a copilot who is about to panic because his fuel chart graph is beginning to look like the stock market crash of the 1920s, that I had probably chosen the wrong crew and

profession. So much for that, but by now I was hoping that I could even find the Azores.

Radio transmissions on all frequencies are nothing but interference and static, we can not reach "Sky King," Bermuda or the Azores with the radios because there was one giant weather cell building from Bermuda covering the Azores all the way into Gibraltar. I projected our new course on the J.N. (special jet navigation chart) and as the copilot was now reporting that the fuel was now well below the planned fuel curve, I have several headings planned ahead to alter heading and fly direct into Lajes AFB, the Azores. To add to the confusion, we then heard a stray clear ungarbled radio transmission that a KC-97 had crashed on the runway at Lajes AFB and the runway was closed.

With everything falling apart around us, I discovered that the "Gourmet" flight lunches that they had promised us at the preflight briefing weren't "Gourmet" after all. Somehow the milk container ruptured and soggy sandwiches were the "Blue Plate Special" for the day.

Even if the runway at Lajes AFB was closed, I secretly wanted to go there, because it at least would be a friendly place to bail out. As we proceeded eastward in moderate to heavy turbulence, we started picking up more broken radio garbage and then heard a radio message transmitted in the blind on Guard (we called it the Navy channel) that the Air Refueling Point (ARCP) has been moved two degrees south and three degree east to get away from the weather. We tried to make radio contact to confirm that we wanted, needed and was willing to beg for fuel (with or without "Green Stamps") but our transmissions were never acknowledged. With no other options, we proceeded to the "New" ARCP in hopes that when we were closer we would be able to make radio contact, find a tanker return and at least take on enough fuel to reach the West Coast of Africa, when we knew the "Strip Alert" tankers at Benguerir AFB or Sidi Slimane AFB could help us.

In the meantime, we had discontinued celestial observations because the sun had now passed behind us and was obscured. We are letting down in weather and I am relying only on D.R. with winds that are twelve hours old. We can not raise the KC-97 tankers, and with no other option the pilot decides to continue to let down to conserve fuel and proceed into the "New" ARCP area in hopes we can find a tanker as our fuel situation is rapidly becoming critical. The old KC-97's had poor radios and navigation aids and we were having no luck communicating with anyone. We proceeded to let down to 16,000-ft. in weather, which was the planned refueling altitude and by using the radar to direct the aircraft around some tremendous "Thunder Bumpers" we were still hoping to find a tanker radar return, but no such luck. We would occasionally hear some broken radio transmissions, but never could make any decent readable contact.

Fuel was down to 10,000 pounds, and because the ARCP had been moved 120 miles south and 180 miles east we were so far from the planned course that we couldn't make the Azores or Madeira Island which was the most westerly of the Canary Islands. So ejection/bailout over the Atlantic in a stormy sea was eminent. I knew that the major steamship shipping lanes from England and Europe to South Africa was approximately 300 miles off the eastern coast of the African continent. "Pucker Power" was taking over, and the radar showed some clearings below us, so I suggested that we continue to let down and try to spot a ship "return" to bail out near. We were transmitting "Mayday" in the blind, which was never acknowledged (or received by anyone to our knowledge). The copilot announced pounds of fuel, so engine shut down was coming up next, and the B-47 has a glide ratio of a Volkswagen Bug.

I had cleared my navigator's desk, checked that the seats ejection pins were out and that the seat was armed, stowed my D.R. computer, Weems plotter, dividers and made sure my flight case and gear was clear of the navigator hatch which ejected downward. The earlier models of the B-47 were not equipped with ejection seats, so fortunately ours had been modified so I proceeded to ready myself for a long relaxing swim in the Atlantic. I checked my two little home made "Fishing kit" survival packs that included lures and mono filament line in my lower pant leg flight suit pockets, again checked my seat survival pack which contained a small life raft and minimum sea survival equipment, stuffed the remainder of my "Gourmet" flight lunches (an apple, small can of peaches and two packages of Planters peanuts) in my jacket pockets as well as made sure the back pack parachute harness and "May West" straps were all snug, tight and tucked in. I told the pilot that I was planning to eject (downward) at the first sign of engine shut down. The staff officer fourth crewmember had decided to bail out after me through the Navigator hatch, rather than the recommended port entry hatch escape route. The chances for a successful bailout for this fourth crewmember through either hatch were poor to zip, and his survival was unlikely, not that my own downward egress was all that safe.

By now the J-47 jet engines were running on fumes and with 6,000 pounds or less of fuel on board it was just a matter of a few minutes until the alarm bell would sound and then "Geronimo." We broke out of the weather at 7,000 feet and I immediately picked up a radar return at eight miles, slightly to starboard. We turned right toward the "Steamship" return and I realized that with our rate of closure it was moving... "Thank God," for it was a KC-97 who had separated from his flight and was heading to the Canary Islands since the Azores was closed. Talk about exciting, his APN-69 "parrot" beacon was inoperative but we were able to contact him and my pilot immediately regressed to his P-51 days and approached the KC-

97 like he was attacking an ME-109. After completing the air-refueling checklist and opening the fuel receptacle door, we latched on to the air-refueling boom of the KC-97 with less than 4,000 on the gauges. As we started taking on fuel, we immediately approached a stall because the KC-97 with "Balls to the Wall" power couldn't give us enough airspeed, especially at that altitude. Between the tanker pilot flying with maximum power and us flying with minimum power, (I think we were actually pushing him) the next few minutes were rather "hairy" to say the least. My A/C jockeyed that B-47 like it was a P-51 and we probably made the lowest level air refueling outside of an air show. It was reassuring to hear the fuel surging through the main air-refueling receptacle and fuel-plumbing pipe, which was just forward and slightly right of the navigators desk. We finally were able to take on enough fuel to take us to the next refueling ARCP or within range of the strip alert tankers at Sidi Slimane. The tanker pilot reported that he had heard us on "Guard" earlier but was unable to make contact and figured we had already ditched or bailed out. We had found the tanker just in time as he was planning on dumping fuel (JP-4) shortly to extend his range and to make his landing at a strange field in the Canary Islands a little safer. We thanked him profusely and his navigator gave us his "WAG" (Wild Assed Guess) fix, which was about ninety miles from my D.R. position (with the usual weather, the jet streams we had encountered as a tail wind had moved us farther east than I had predicted). Fortunately with this updated D.R. position we altered heading and started to climb out to intercept our original planned course as it passed over the NW coast of Africa. After level off, I was able to get a positive radar fix off the western tip of the Madeira Islands and made a course correction to port to bring us on track to converge on the next ARCP where we would take on enough fuel to complete our planned simulated attack on the designated target and complete the remainder of the flight.

Once over North West Africa just west of the Atlas Mountains, we cleared the eastern buildups of the weather and were able to make contact with our second KC-97 tanker, and made a normal air refueling and on loaded our scheduled fuel. As we flew eastward, parallel to the northern shores of Libya I continued to update my navigation fixes and stay on the planned course. With a "Side Step" S-turn maneuver we were able to adjust timing to bring us over our I.P. (Initial Point) at our scheduled time. As we turned SE on our planned bomb run (a camera attack), I made sure that the bomb bay doors and the bomb racks were in the closed and locked position so that we would not drop the Mk-6 concrete bomb on some unsuspecting native. The maximum range of the radar crosshairs was only fifty miles, which made for a rather rapid bomb run, in addition because of a 125-knot tailwind; our ground speed was a little under 550 knots (about nine miles per minute). This allowed a little less than 5 minutes to identify both of the planned offset aim points,

make necessary wind corrections to kill drift and reach the BRL (Bomb Release Line). Fortunately, because of the land water contrast in the area it was fairly easy to identify the initial and final offset aim points. After adjusting altitude, rechecking offset settings in the bombing computer, rechecking ballistics and killing the drift of the radar bombing crosshairs, I was able to identify the final aim point. Unfortunately, with the loss of the autopilot, (which was an integral part of the bombing solution) the pilot was manually flying the aircraft, attempting to maintain an accurate heading and hold a steady altitude. This simulated bomb run wasn't all that easy, but we had practiced this type of procedure in the past and were able to make it happen.

We found out later that we were the only aircraft in our original cell that actually got to the assigned target of Bizerte. Upon landing, maintenance discovered a big flash burn spot on the Port side of the forward radome where the lightning had entered the aircraft and also a fried electrical wiring harness in the #6 engine compartment where the lightning had exited the airframe, (so much for the Bermuda Triangle claiming another victim). After being up so many hours before the flight, the "Uppers" and "Downers" and the eighteen hour flight, needless to say that double shot of whiskey administered by the Flight Surgeon at debriefing did me in.

The giant weather pattern was moving eastward and the B-47 cell of five airplanes immediately following us, which had been delayed because of the tanker accident in the Azores was caught up in the middle of the worst part of the weather. Unfortunately the #5 airplane was lost letting down for fuel just south west of the Gibraltar refueling area. For days thereafter, a massive air/sea search was conducted but no wreckage was ever found and the three crewmembers and passenger were presumed dead. The overall results of this particular "Reflex" mission were terrible because of the weather and the overzealous ambitions of the commanders. We had met the challenge of this particular dangerous mission, had completed the mission (not quite as briefed) and our photo score gave us the 5th best scores in the wing, so we were "sort of" heroes. Better still, we as an "R" crew had earned the respect of my fellow navigators and the entire organization. Shortly thereafter, we were upgraded to Lead Crew status.

After reaching Lead Crew status and logging several hundred hours in the B-47 including a couple of "Immelman" flights, I was assigned to B-52s where I earned the status of Select Crew. Four years later I was fortunate enough to be selected and assigned to the B-58 Supersonic Hustler program where I soon became an Instructor as well as Select Crew status. During my twenty-five year career I had over eleven years as a SAC crewmember and several years as an Instructor and Staff Navigator. As a Radar/Navigator crewmember I logged sev-

eral thousands of hours and flew literally hundreds of sorties, both high-level, including the "Chrome Dome" twenty-four hour "Alert" polar missions as well as many low-level "Oil Burner" training missions. Supersonic missions in the B-58 Hustler were especially interesting and challenging. The B-58 airplane, crew selection process, training and performance created one of the finest weapons delivery systems in the free world. (Unfortunately, the B-58 wasn't "Politically" correct and was retired early.) In retrospect, of all of the combat missions and training missions flown as a SAC Radar/Navigator. In the B-47, B-52 and the B-58 Supersonic Hustler, the mission I remember most as the most frightening yet challenging and rewarding of my flying career was that "Reflex" mission to North Africa.

How I Learned to Love Navigators

By Colonel Richard H. Wood, USAF (Ret)

Back in the mid-1950s, I was flying the B-47 as a very junior Aircraft Commander. I was still a lieutenant and both my copilot and navigator were senior to me. My only advantage was that I had more flying experience than both of them together and I was in charge – at least as long as we were in the air.

The B-47 was a six-engine, swept wing, high altitude jet bomber. It was our premier bomber and, at that time, there wasn't a fighter in the world that could touch it. I was just barely becoming comfortable in it and learning to trust the other two crewmembers somewhat.

In those days, one of the three B-47 crewmembers had to be triple-rated; a triple-headed monster as he was called. In our case, it was the copilot. Shortly after he graduated from flying school, they hustled him off to navigation and radar bombardier school and gave him those ratings so he could fly the B-47. Unfortunately, he had spent most of his career in training and little of it in the air, so they stuffed him in the back seat and gave me (a mere pilot with a lot of flying time) the front seat.

One of the many problems with this arrangement was that I didn't understand celestial navigation or radar bombing and I wasn't certain that the copilot or the navigator did either.

When the B-47 was built, General LeMay did not bother installing any long-range navigation equipment. No LORAN, no HF/DF, no nothing. Doppler and inertial navigation systems had not been invented yet. The feeling was that if we ever went to war with Russia, those cheating bastards would probably turn off all of their radio stations and we would have a hard time finding Moscow. Therefore,

all strategic bombers depended strictly on celestial navigation. Russia would have a tough time turning off the stars.

LeMay was probably right, but my experiences with navigating a high-speed jet bomber by the stars did not give me a warm feeling. We would go out and practice a two-hour celestial navigation leg and immediately get lost. As long as we were over the United States (friendly territory), I could tune in my LF or VOR radio and tell exactly where we were. In the meantime, the navigator was tooling off at about a thirty degree angle to our predicted path based on what the stars told him. This did not look good to me. I tried giving him a few hints about where we really were, but he wasn't buying. "No problem," he would say, "We will make a final course correction and arrive at destination."

We would make a final course correction, all right, but calling it an arrival at destination was stretching the point a bit. We would usually get within about twenty miles, which seemed to make the Navigator very happy.

"Good job," he would say, "We aced that one!"

In my opinion, twenty miles off course at a speed of about 500-mph was fairly close to being lost. I didn't think Moscow had much to worry about from our crew. As long as we didn't go to war or stray too far out over the ocean I was willing to let the Navigator putter around with his silly celestial shots and go any place he wanted to.

The pot boiled over, so to speak, when we were directed to fly our plane to England. Alone. No escort. Not even an aerial tanker for refueling.

"My God," I thought, "We're going to get lost, run out of fuel, crash into the Atlantic Ocean and die!" I mentally figured what a twenty-mile navigation error in two hours would be like over eight or ten hours. There was no way, I decided; that we could find Europe never mind England. I hinted around that this was not a good idea. We should at least have a tanker so we could top off the fuel as we left the United States. Without one, the navigation had to be on the money or we were going to arrive with fumes in the tanks if we arrived at all.

No chance. The tankers were all doing something more important that day. What, I could not imagine.

"Well," I decided, "I am the fearless leader of this crew and it will be my responsibility to save our lives regardless of where the Navigator takes us." I became a student of North Atlantic radio facilities and rescue procedures. That's when I discovered the existence of Ocean Station Vessels.

Ocean Station Vessels are now extinct, but they were ships provided by one or more nations to mill around in international waters at specific locations and provide weather and navigational assistance to shipping. There was one orbiting around twenty degrees west longitude very close to our course. It had radar and the ability

to talk on aircraft emergency frequencies. Its call sign was Ocean Station Juliett.

"Hot damn," I thought, "We're saved." All we had to do was to get lost within radio and radar range of Ocean Station Juliett. They would give us our position and we could coast into England by dead reckoning. No problem! Who needs a navigator?

I drew up my own set of maps and became the world's foremost authority on doing business with Ocean Stations. I was ready to go.

On the night of the flight, the weather was good and we even had a slight tail wind. That didn't help much. When you are flying east you are supposed to have a tail wind and that had already been factored into the fuel reserve problem. More importantly, there was no high cloud cover. When heavy, the B-47 could not climb much above 26,000 feet and if the clouds were higher than that, you could forget celestial navigation; at least until you burned some fuel and got light enough to climb higher.

We took off and headed northeast for New Foundland and coasted out of the North American continent into the North Atlantic. That's a little scary the first time. Our high frequency radio was safety-wired off, as General LeMay didn't want the Russians listening to us. Thus we said "goodbye" to someone in New Foundland and we were essentially out of touch until we said "hello" to someone in England. We were on our own.

Except, of course, for Ocean Station Juliett. I knew roughly what the range of their radios would be, but my impatience got the better of me. I started calling them about two hours before they could possibly hear me.

In the meantime, the navigator was busily navigating. In the B-47, either the navigator or the copilot could take celestial shots by poking a periscopic sextant up through a hole in the nav compartment or the copilot's canopy. The nav always claimed to be severely busy. Since no one could see him, no one could dispute that. The sextant-shooting chores fell to the copilot who was seldom busy on long nav legs.

The nav was calling for a set of three-star fixes about every half hour and also running something called, "pressure pattern navigation," which I understood even less than celestial navigation. The principle conversation on board was the nav and copilot arguing about star location and identification. Since they were both supposed to be qualified navigators, this didn't give me a warm feeling either. We hadn't made a single heading change since we left land and that worried me. The navigator's views of my Ocean Station Vessel scheme are not printable.

This went on for several hours – the nav navigating, the copilot shooting stars and me calling OSV Juliett about every ten minutes. Finally Juliett answered which was perhaps the best sound I have ever heard. We weren't going to die after all. I had saved us.

The French were running the OSV that month, and a voice with a very thick French accent flooded my earphones.

"Roojure, Air Force two tree four, we hear your transmishyown and we have you on ze radar equip-a-ment. You are on a bearing of two-eight-fiver degrees from our posishy-own at a distance of exactly one-niner-zero nautical miles."

I mashed the interphone button. "Did you get that, nav?"

"Yeah, I got it." I detected a lack of enthusiasm for this news.

Ocean Station Juliett continued. "Unfor-chu-nat-lee, we have been sailing under ze overcast for two weeks and we don't know where we are. Could you please give us our posishy-own?"

Good God. They were depending on celestial navigation, too. They were lost and didn't care! They weren't going to run out of fuel and crash. The navigator switched his transmitter on and gave them their position. They were profusely grateful. The nav switched back to interphone and gave me a heading correction of two degrees. We hit the entry point into England precisely on course and on time. After we landed, I didn't exactly kiss the navigator, but we certainly entered a new era of improved relations.

Maybe this celestial stuff works after all. Maybe Moscow better start worrying.

I'm the Navigator and I had Nothing to do with that Landing!

By Lt. Colonel Alex P. Brewer, Jr., USAF (Ret)

It's the early 1950s, MacDill AFB, Tampa, Florida. Col. Mike McCoy was the 306th Bomb Wing Commander. My B-47 Aircraft Commander somehow got the idea that volunteering for what ever come along would somehow get us extra "brownie" points for a coveted "Spot" promotion. SAC 50-8 requirements were challenging enough for Crew L-72, but my pilot always hung around after duty hours and was a frequent Saturday morning volunteer. He would somehow get into the command post over the weekends and always knew about upcoming special requirements and extra missions that were available to volunteer for.

I wasn't surprised to find out that the A/C had volunteered us for a "Special" SAC promo mission to Bryan AFB, the Air Force T-Bird (T-33) school in Texas. Someone at SAC got the brilliant idea that showing off a B-47 to the student pilots at Bryan would somehow help SAC'S image and that the young pilots would be standing in line to volunteer for SAC. My copilot had been a recent graduate of this advanced pilot training base and was a classic example of a young pilot who

had no concept of the SAC mission or of the importance of the navigator-bombardier on a SAC crew. The aircraft commander was elated, but I wasn't all that excited about giving up a weekend, especially in Texas in the middle of the summer, (trying to impress a bunch of student pilots who probably had very little interest in SAC.)

The Friday mission was planned to go like this: Take off from MacDill; fly a routine training mission, land at Bryan. Then on Saturday, show off the bird with a static display, give a recruiting pep talk to the student pilots-cadets and then return to MacDill on Sunday, so we could get back to work on Monday morning.

After planning the regular 50-8 training mission on Thursday, we departed MacDill early Friday morning and flew a radar navigation leg up to Atlanta for scheduled RBS runs against the Atlanta RBS site. We then proceeded west to make a couple of RBS runs on Oklahoma City then down to Dallas Nike site for a couple more simulated bomb runs. By now we were over six hours into the mission and after making a north to south camera attack on Dallas Nike we proceeded southbound to Bryan, which is just north of San Antonio. Everything was going normal with the copilot making the usual chatter on the radio and as we approached the let down fix for Bryan, the tower advised him of the runway temperature, in Celsius. The copilot asked me over intercom to convert the Celsius temperature they had given us to Fahrenheit. This I did, and after convincing him that the conversion was 110 degrees Fahrenheit, he began figuring the stopping distance from the Dash-1 chart. This was interesting, as some mental midget at SAC had insisted on us making an initial flyby at 1300 local, with a planned landing at 1330 (the hottest part of the day). By now the two pilots are arguing about aircraft gross weight and runway length and all those factors, which account for a safe landing on a short field like Bryan. In addition, at the pilot's request, we had made our arrival over the fix a little heavy on fuel (as he wanted to get a look at the runway and surroundings before making this short field landing). The copilot was talking to Bryan tower and the tower had somehow got the message that we were coming about two hours later and consequently had several T-Birds airborne with student pilots in the local area. After making a radar directed let down into the Bryan airspace and bringing the aircraft down the centerline I now became more or less a passenger and merely monitored the upcoming events. I of course had my own Dash-1 weight/landing charts in front of me and was carefully checking on their activities.

In any event, we were cleared for an orientation pass over the field and with us being heavy on fuel; the tower requested that the T-Birds stay clear of the area to let us do our thing. After doing "our thing" several times and buzzing the hell out of the local area (after all the B-47 was a little noisy at low altitude) we were still too heavy to land. Three or four T-Birds, called Bingo on fuel and were sand-

wiched in for minimum fuel landings between our flybys. I really broke up when I heard one of the instructor pilots declare on the radio that if he were armed he would shoot us down. As we were finally getting the fuel burned off, the pilot elected to put out the approach chute. This brought on several unsolicited comments by the T-Bird pilots who were still flying and it looked like we were finally going to make an attempt at putting it on the ground. Later, we found out that a local Texas "redneck" called the base to advise them that someone had bailed out of the airplane and a body and a parachute was hung up on the tail. (Probably the same guy who reported seeing a UFO landing in a pasture west of Waco.) I leaned over to the left and looked back over my shoulder at the crew chief, who we had brought along to prepare the aircraft for the return flight. He was strapped in the crawl way seat and had this look on his face that indicated his "pucker power" had reached critical mass.

On what I hoped would be the final approach, we came over the fence a little hot and since it was hot out there that big bird really wanted to float and float and float. The pilot swallowed his pride and finally brought the power up to make our first go around ... just about the time the engines spooled up and the power finally kicked in. We were in a great position to land altitude wise except there wasn't anymore runway left. My position was scary to say the least as I was wishing that there was an upward ejection seat for the nose position, and by now the crew chief was probably wishing he were on K.P. or in the Navy. After flying a shortened pattern because fuel or lack of it was now becoming a problem, the A/C now made what I would describe as a tactical fighter approach at low altitude with some sixty degree bank turns which was really hairy and scary. He somehow lined up and had the speed bled off as we came over the fence pretty well and started our final landing. Again the "float" problem, but this time he had the altitude and airspeed pretty well under control and managed to stick the front trucks on the runway at about the 500-foot marker. This was an interesting (new) pilot technique to landing this big 6 engine swept wing pride of the SAC fleet and contrary to a briefing I had attended with "Tex" Johnston telling the pilots to never – never do this. With just about the entire cadre of Instructor pilots, student pilots, base personnel and several interested civilians, the landing now became a classic impersonation of what a porpoise looks like at Sea World. Somewhere around the 3rd or 4th bounce I heard the pilot say, "Sh@!", which the copilot interpreted as chute.... so he deployed the brake chute. I think at the time he deployed the brake chute the rear mains were on the runway and the nose (with me hanging on for dear life) was about 30 feet in the air. We banged down really hard and I thought for a minute that I had blacked out as my helmet sunshade slammed down on the bridge of my oxygen mask. Boeing never used the word in the emergency section of their Dash-

1, but had general Dynamics written the Dash-1 for the B-47 they would have said that this type of landing would give you "CATASTROPHIC" results.

The two pilots were frantically pumping the brakes and were now screaming back and forth at each other blaming each other for this controlled series of crashes. The tower interrupted the discussion between these two gentlemen and asked if we needed assistance.... like a wrecker, fire truck, an ambulance I suppose. The copilot STRETCHED THE TRUTH and told the tower that everything was under control and everything was fine. They managed to stop just short of the overrun and the tower advised us to turn right on to the last turnoff, which was directly under our nose. Unfortunately, in the turning process the forward mains proceeded to sink into the hot asphalt of this short taxiway. The "Follow Me" truck and the fire truck were in a mad scramble to get out of the way. By now, the rear mains were still on the active with the front mains sunk in the soft asphalt of the taxiway. The tower tells us to shut down and meanwhile they are diverting the remaining T-Birds into Randolph AFB or Bergstrom AFB, which is just a few miles south and north of our position. Two T-Birds were Bingo on fuel and were allowed to land on the runway behind us, before the base was closed because of our "stuck" position half on and half off the active. SAC had arrived.

I had my briefcase and my overnight bag ready to go, so as the pilots were doing their shut down check list, the crew chief opened the hatch, lowered the ladder, climbed to the ground and walked under the aircraft to inspect the forward main gear. I was a few steps behind him and what a nice surprise, as the Base Commander, Pilot School Commander and a handful of full Colonels were there to greet me (the lowly navigator). The greeting party had been out there in the sun and heat for over two hours and their uniforms were wet with perspiration and they did not appear to be happy campers. They erroneously assumed I was the pilot and all had this, "What the hell were you doing?" look on their face, so after saluting the brass, I announced for all to hear that, "I'm the Navigator and had nothing to do with the landing." The old Colonel Base Commander who was near sighted took off his glasses, leaned over and looked at my navigator's wings on my flight suit and said, "Damn." The others, (all pilots) shook their heads in disgust, as I was probably the only Navigator on the base and having to cope with a "Wise A@!" Navigator at a time like this didn't really make their day.

Saturday's briefing for the students was a fiasco with questions like: "Was that a normal landing?" or "Do you usually make that many approaches?" or "How long do you have to stay in SAC?" With most of these students aspiring to be "fighter jocks," I am sure that our visit to Bryan set back the relationship with training command and SAC several years.

With the help of the base civil engineers, some huge planks and a lot of tugging, they finally backed the airplane onto the hard surface runway and tugged it down to a concrete crossover where it was tugged off the main runway. SAC flew in a recovery team from Barksdale AFB to repair the hydraulic seals on the front mains and check out the airplane. So after spending a week in the heat at Bryan, with the pilots taking flak every day, we were finally able to recover the airplane and get back to MacDill.

Fortunately I wasn't asked to attend the special debriefing that Colonel McCoy had with the pilots, I am sure that it was really as hot as the runway temperature at Bryan. After all, I wasn't invited because I was just the navigator and had nothing to do with the landing.

P.S. Never did get that "Spot!"

The B-47 in the 1955 National Air Race

By Lt. Colonel Joseph D. Brown, USAF (Ret)

Early in 1955, the Strategic Air Command (SAC), Boeing Aircraft Company, General Electric and the producers of the National Air Races arrived at an agreement that three SAC B-47 aircraft would participate in the Labor Day race of the National Air Races. SAC decided that one B-47 from each of the three Numbered Air Forces of SAC, Second Air Force, Eighth Air Force, and Fifteenth Air Force would participate.

The 26th Strategic Reconnaissance Wing (SRW) at Lockbourne Air Force Base, Ohio was selected to represent the Eighth Air Force. My crew, with Major William E. Yingling as Aircraft Commander, Captain Herbert M. Poynter as Copilot, and myself, Captain Joseph D. Brown as Navigator, all assigned to the 3rd Strategic Reconnaissance Squadron, was selected to represent the 26th Wing.

The race was to be run from March Air Force Base, California to the Philadelphia International Airport, Pennsylvania. Departure was to be in single aircraft take-off with thirty-minute separation. Take-off sequence was determined by drawing of numbers from a hat. Major Yingling drew number one so we became the first to depart. The race would terminate at 1000 feet over a pylon at the end of the runway at Philadelphia Airport at maximum attainable airspeed. No in-flight refueling would be allowed. Each aircrew would determine the route and altitude to be flown.

When we were assigned to this task, we began to research the performance and fuel data charts to attempt to plan the altitude at which to fly the race in order

to get the best fuel usage with the best speed over the course. Much to our astonishment there were no performance charts using 100 percent power for aircraft cruise. After conferring with the performance engineers at Boeing and General Electric and confirming that these data did indeed not exist, we obtained permission from the Wing Commander to build our own performance charts. The Wing assigned us two of the newest RB-47E aircraft in the wing to fly and build the necessary charts. We flew several sorties, flying at different altitudes, all at 100 percent power setting to allow us to obtain the actual fuel usage's at the various altitudes we anticipated flying.

A few days before the race, we flew one of the RB-47Es, and the Squadron Commander and a make-up crew flew the other aircraft, to March Air Force Base so that we would have a spare aircraft which would be fueled and ready with engines running at the end of the runway in case something did not check out with the primary aircraft at take-off time. Early on the morning of the day of the race, the fuel tanks were finally topped off with every pound of fuel the tanks would hold. We started engines and taxied out to the runway and began our take-off roll exactly at the prescribed time with all systems working perfectly. After take-off we turned toward the east-northeast, and were on our way. The throttles were left at 100 percent rpm and would remain there for the climb-out and cruise portion of the race.

Based on the best weather information we could obtain, we decided to fly the first portion of the race at 20,000 feet because the wind forecasts indicated a slight headwind at higher altitudes. All went well and the weather forecast winds proved to be correct, so we remained at this altitude, carefully watching the fuel curve to be sure we would have sufficient fuel to make Philadelphia with enough fuel to make the approach and landing. In the area of southern Illinois, the fuel was running a bit above the curve, so we made a slight climb up to something over 20,000 feet to get some better air speed.

About the Pittsburgh, Pennsylvania area, we started our descent, holding 100 percent power settings until the aircraft controls (ailerons) began to become ineffective and then gradually decreased the power settings to hold the aircraft in control. As we approached the runway, which I had on radar from several miles out, we began to level out at the 1000-foot level, and the Aircraft Commander had the runway visually. At this point he increased air speed to what would be our pylon speed. The ailerons were now totally ineffective and directional control was by rudder only (Although the redline speed was 456 knots, we passed over the pylon at 480 knots). Throttles were immediately moved to idle but the aircraft continued to surge forward for about twenty miles before it slowed enough to make the turn back toward the runway and enter the traffic pattern. On final approach, the Copilot reported that all fuel-warning lights were showing red.

The landing was normal, and since the aircraft was now so light, the landing roll was relatively short.

We were met at the parking area by the representatives of General Electric and Boeing who introduced us to the officials of the National Air Race. Our flying time from start of take-off roll to passing over the pylon was about three hours and fifty-six minutes.

The other two aircraft, one missing the pylon, made almost identical times.

This information is true to the best of my recollection and reflects our experience and subsequent discussions with the Wing and Squadron staffs.

The B-47 in the 1956 National Air Race

By Lt. Colonel Christian J. Luecke, USAF (Ret)

Forty-three years have passed since this event and I may be a bit fuzzy on some details. However, to my surprise, when I was asked to submit my recollections of this event, it seemed, as though it were just a short time ago! As I recall, this is the way events occurred:

Our B-47 Crew, # S-51 of the 33rd Bombardment Squadron (BS), 22nd Bombardment Wing (BW), 15th Air Force of March Air Force Base California, consisted of Major Joe Schreiber, World War II P-51 fighter pilot, Captain Dennis Peterson, World War II B-24 bomber pilot, and yours truly, Major Chris Luecke, World War II B-29 Bombardier-Navigator. We were chosen to represent the 15th Air Force in the G.E. Trophy race for Jet Bombers at the 1956 National Air Races. Shortly after we were notified of our selection, Colonel Pinkham Smith, our Wing Commander, directed us to report to Major General Archie J. Old, 15th Air Force Commander.

General Old invited us into his office, asked us to be seated and told us that, as he saw it, there were two ways we could get the job done. First, we could request any members of the 15th Air Force Operations, Planning and Weather Staff to assist us in preparation for the event, or second, we could carry out the attempt to win the trophy by planning and executing it ourselves. It took us less than a minute to decide that we would prefer to do it as a crew effort. General Old replied, " I thought you might say that, but my original offer still stands if you care to make use of my staff." He then dismissed us with a handshake and wished us the best of luck.

On our way back to the squadron, we said, "What have we gotten ourselves into?" After briefing our Squadron Commander, Lieutenant Colonel J.J. Casagrande,

concerning our meeting with the General, he was extremely pleased with the result. He then promised us the backing of the entire 33rd BS in our venture. The three of us began to formulate our procedures and approach it one step at a time. First we needed to look at and master the route for the race, which was to be from Bermuda to Oklahoma City. Secondly, we had to select the best aircraft from our squadron for an extended flight at the highest airspeed, which it could handle. Third, we had to obtain this information as quickly as possible by having each crew from our squadron make a short high speed run in their aircraft upon completion of each regular training mission. Our squadron commander agreed to this step and the search began.

After a few weeks, each aircraft in our squadron had been checked for high speed performance and handling. After selecting the right plane for our mission, we asked our engineering officer to have all six engines checked for maximum thrust under full power. Two of the engines produced less than maximum power (they had not been built by General Electric), and he replaced them with G.E. engines, which produced the required thrust. By this time, we were authorized on each training mission to select an area to practice flying at continuous full power. Our wing commander ordered us to take a flight to Bermuda to check all the facilities at Kindley Field, Bermuda. On this trip, our aircraft crew chief, Technical Sergeant Richardson, accompanied us to make certain that any maintenance we might need before our trip would be available.

Upon our return to March, it was suggested that a clean shiny aircraft could pass through the air more readily. Colonel Casagrande recruited the entire squadron for a hand polishing of our aircraft on the next Saturday. On that day, shortly before the race, everyone from the newest airman to the squadron commander polished our aircraft by hand, till it shone like a "newly minted dollar." A short test flight produced a significant increase in airspeed! Just before our departure for Bermuda, our ground crew applied missile putty (we never asked how they obtained it) to all the panels not required to open in flight to seal them for smooth airflow.

Both local and national media provided excellent coverage of this event. One aviation writer said in his article, "The hardest record to break will be last year's winner of the G.E. Trophy, who managed to fly the west to east course at 597+ miles per hour with a tail wind." (As opposed to a headwind forecast for the east to west event in the 1956 Air Race.)

Our families and friends wished us farewell and good luck as we departed March AFB for Kindley AFB, Bermuda. After an uneventful flight, we arrived at our destination to ready ourselves and the aircraft for the big event. Pete and I prepared eight different flight plans at 2,000-foot intervals so we could select the

altitude, which gave us the least amount of headwind. The three of us discussed every possible snag that might occur, and what we planned to do about it should it occur. Rich carefully supervised the refueling and preflight maintenance of our bird.

On the morning of the race, the B-47 crews representing the 2nd Air Force, 8th Air Force and the 15th Air Force launched at specific intervals, with the time commencing with the release of the brakes at Bermuda, and ending with the flyby of a specific pylon at Oklahoma City. His worship, the Lord Mayor of Hamilton Bermuda, gave me a sealed jar of Bermuda sand and a letter of greetings for the mayor of Oklahoma City should our crew win the race.

We were the last aircraft to take off. When we saw our opponents start to climb out immediately after take off, we felt that we had an edge because we planned to hold off on our climb until we achieved at least 425 knots airspeed. Shortly after level off, we lost the bombing function of our radar, which we planned to use enroute to obtain winds, so ... we pressed on without it.

We changed altitudes several times to take advantage of our best groundspeeds. At one point, over eastern Arkansas, Joe called me on intercom to tell me that his radio indicated that we were twelve miles north of the course. After careful checking, I called Joe to tell him we were right on course. We continued on. (After the race, we discovered that the radio station was misplotted about eleven miles on the chart we were using.)

As we approached our pre-planned descent point for our pylon flyby, Joe had to delay our descent due to control problems he was having. Upon landing, we learned his control difficulty was caused by a panel which had departed the aircraft somewhere enroute. We did the required flyby, landed with barely minimum fuel, and followed the jeep to our assigned parking spot. We noticed hundreds of people with cameras rushing toward us. After shut down. We climbed out of the aircraft and saw a four-star general waiting for us. We later learned that he was General Ed Rawlings, Commander of A.M.C. He told us that we were the winners of the General Electric Trophy and had achieved an average speed of 601.187 MPH., which exceeded the record, set the previous year.

We were later led to a big stand where the trophy was presented to us before the crowd of over 100,000 persons. That night we were driven to the local television station for an interview with Joe Schreiber during the intermission of the G.E. Theater program which was hosted by Ronald Reagan. Our families and friends called and telegrammed to let us know that they had seen us on TV, and to congratulate us. Upon our return home with the huge trophy, we were met by our families as well as General Old and Colonel Smith. The trophy was put on display in our wing headquarters and each crewmember received a miniature trophy. Mine is on display in our den to remind me of that "Fifteen minutes of Glory."

Several weeks later, our crew was feted at the G.E. Engine plant and by a special banquet at a major hotel hosted by noted commentator, Drew Pearson.

B-47 Low Level & LABS Tactic

By Lt. Colonel Barnett B. Young, USAF (Ret.)

Back in 1954, a group of Strategic Air Command (SAC) senior officers witnessed the test firing of a Falcon missile at the White Sands Proving Ground. The Falcon, fired at a thirty degree angle off the rear of a QF-80 Drone, locked on and flew straight up the tail pipe, destroying the target on the spot. What scared these officers, including (then) Colonel William "Butch" Blanchard, Deputy Director of Operations, SAC, was the fact that the Falcon was infrared (IR) guided. It was evident to all present that multiplying the IR emissions of an F-80 by six for the B-47 and eight for the B-52, could well add up to the death of high altitude strategic operations.

Lt. Colonel Doug Nelson, later to be the SR-71 program manager, was given the job of finding a way to defend bombers against IR guided missiles. After much study of the problem it was agreed that low altitude penetration was necessary for the survival of the SAC fleet. The staff approached the Boeing Company in Wichita, Kansas and the Air Proving Ground Command (APGC) at Eglin AFB, to develop the necessary aircraft modifications and tactics for employing the B-47 at low altitude. The B-52 was in the early phases of the test program at the time.

The SAC staff briefed Maj. General Patrick W. Timberlake, APGC Commander, and Colonel Harry G. Goldsworthy, Director of Operations. They then called in Colonel Water B. Putnam, Commander, Operational Test Center, and myself, Major Barnett B. Young, B-47 Senior Project Officer, to hear what SAC was proposing. The entire group sat open-mouthed as they heard Lt. Colonel Nelson propose navigating to the target at altitudes below 500 feet and airspeeds of 425 knots, and delivering a nuclear weapon with a "toss bomb" maneuver. (It was eventually decided that a "half-Cuban-eight," with a release near fifty-five degrees of climb, was the optimum for the airplane.)

Boeing and APGC personnel participated in the planning and aircraft modification phases of the test. Boeing test pilot, Richard W. Taylor made the first flights with aircraft 52-642. I went to Wichita and flew with Taylor on the final flights of the test. Assured that the aircraft would perform the required maneuver, the team then approached the problem of navigation at minimum altitude.

Major George Gradel was selected as my test navigator and Captain Eugene Murphy as my copilot. They selected a series of navigational routes, starting with flights over the flat terrain of Florida performed only in good weather. Modifications to procedures and to the navigational equipment were accomplished as the crew gained experience. Missions were flown over increasingly difficult terrain, in marginal weather and, finally, at night. There were problems, but as experience increased, so did the accuracy of the navigation. Fifteen navigation missions were flown on Phase I and included missions over such severe terrain as the Dakota badlands and the mountains of both Maine and Idaho.

Phase II called for participation by a SAC aircraft and crew. Both crews in Phase II flew a number of successful missions. The final mission was to be a strike mounted from Kindley AFB, Bermuda, against Sandy Hook, New Jersey's radar and ECM complex to test the over water navigation and the ability of fighter interceptors to locate the incoming aircraft. My crew completed the mission successfully without being intercepted; however, the second aircraft crashed after takeoff from Bermuda. It was later determined that the cause was not related to the test mission, but was the first of a series of "drag angle" wing attachment failures. This caused a delay of approximately three weeks while the accident was investigated.

Satisfied that the aircraft structure could stand the punishment of low altitude turbulence and the G-forces necessary to accomplish the weapon delivery maneuver, clearance was given to proceed with Phase III. This was the actual bomb delivery phase.

Boeing pilots demonstrated that the bombs would clear the bomb bay and the APGC crew started the actual tests. Approximately 80 practice bombs were dropped on ranges 50 and 54A at Eglin during the next three months. The navigational test results indicated that the target could be located and the bombing results proved that the accuracy was acceptable. The final drops were made with simulated nuclear weapons of the size and shape planned for the SAC mission.

Briefly, the bomb delivery maneuver called for approaching an initial point (IP) some five miles from the target at an air speed of 425 knots and an altitude of less then fifty feet. Radar could be used to locate the IP or the target and the radar navigator determined ranging. There was also a visual mode, which utilized a point a known distance from the target as the "pull-up" point for the maneuver. A timer built into the system allowed latitude in the selection of the IP. Once the timer had run out, a light and needle indication on the LABS (Low Altitude Bombing System) gave the pilot the signal to start the pull-up. A force of 2.5 Gs was applied and held until the initial stall or buffet was encountered. Then the G-force was reduced to keep the aircraft just above the edge of a stall, completing the half-Cuban-eight maneuver, rolling out 180 degrees from the target.

Satisfied that the tactic was both necessary and feasible, SAC ordered three bomb wings to prepare to convert to the low altitude missions. I was transferred to the 22nd Bomb Wing at March AFB and Captain Murphy went to the 310th Bomb Wing at Forbes. (Later I was put on TDY to MacDill AFB, where I trained the pilots selected to be instructors in the 305th Bomb. Wing.) Crew training progressed satisfactorily, but not without accidents. A MacDill crew crashed on a mission at the Eglin bombing range; it was later determined that this was also a wing attachment failure. One crew at Forbes failed to roll out at the top of the delivery maneuver and attempted to eject at too low an altitude. Later, three instructor pilots at March were lost on a single mission while practicing the maneuver at night off the California coast. The cause of this accident was never determined.

Almost as the last of the crews were reaching a combat-ready status, the entire B-47 fleet began to encounter structural failures. Analysis determined that a modification to the aircraft, which included strengthening the wing attachment fittings (the "milk bottle" modification program) was required. The low altitude navigation missions were continued, but the actual bombing maneuver was put on hold pending further evaluation. It was eventually decided to utilize a "pop up" maneuver with drogue-retarded bombs rather than the LABS. Fortunately, the B-47 was never called on to actually deliver a weapon against the enemy and went into retirement basically "without firing a shot in anger."

Although the B-47 never used the LABS tactic in combat, intelligence sources indicated that Soviet defense planners burned a lot of midnight oil trying to come up with a defense against it. The training and experience gained during this program was later of great value in the conversion of the entire SAC fleet to a low altitude capability.

LABS Maneuvers

By Lt. Colonel Robert M. Winn, USAF (Ret)

You have not lived if you did not have the pleasure of doing the LABS maneuver in the B-47! For those who do not know, the LABS maneuver was a nuclear delivery tactic to escape the nuclear blast that was done by fighters where you come in at a high speed & very low altitude, pull up into a loop and then, at the top, roll right side up as the aircraft nosed down. A dive attitude was held until a given airspeed was reached which became the primary reference to maintain the dive back to low level and 180 degrees from whence the attack started. SAC brought in T-33s and instructors to teach us how to do this.

The B-47 was equipped with an instrument similar in looks to an omni instrument when in the ILS mode. We would be at about 200' AGL and a speed of 425 KIAS (which was the redline for the B-47). At a designated point prior to the target we would hit the start button on this instrument. A number of seconds later the crosshairs activated and we would try to keep them centered. By doing so, we would automatically keep the wings level and hold a constant 2 G climb to the top of a loop before rolling out and then the copilot would count off the airspeed as it built back up. These was done in thirty knots increments and, take my word for it, he could not call it out as fast as it built up. Therefore, at 400 KIAS either pilot was to yank the throttles back to idle and ride the 400 knots back down to low altitude. This was supposed to clear the aircraft of its own nuclear bomb blast.

Well, in theory that was the way it was to go. However, many times the crews experienced aileron reversal prior to pull up. I had it happen quite often. There is nothing like flying along side and watching another B-47 start its pull-up and actually see the fuselage start to bend into a U-shape almost as the aircraft 'reluctantly' entered the maneuver. But, the scariest of all was the time the instrument malfunctioned, unbeknown to us, and it caused us not to have the proper G pull-up. As a result, I found myself, upside down, at the top of our loop, and NO AIRSPEED! It was ZERO!! I had absolutely no aileron or elevator control! I remember praying that the aircraft would fall nose first, straight through the horizon. I was not interested in getting into a flat spin, up side down, in any aircraft, and certainly not in the B-47!!! The nose did come thru, we regained airspeed, rolled the wings level and finished the mission. That was all the excitement I wanted for the remainder of that flight!

The B-47 would do the maneuver; the big question was how many times each tail number would do it before coming apart. After several aircraft and crews were lost the powers above actually listened to those of us in the program when we expressed our concerns. After an investigation in which we were asked our opinions it was decided to discontinue the maneuver. Glory Be!!

The Day South Carolina Was A-Bombed

By SM/Sgt Norm Viehweg USAF (Ret.)

The time was 1958, the height of the cold war when nuclear saber rattling was commonplace. In today's environment it is hard to imagine a nuclear incident like this happening without it making headline news all over the world along with anti-nuclear demonstration and huge lawsuits. However, this was March 1958 in Mars

Bluff, South Carolina. The movie Doctor Strangelove with the nutty aircraft commander ridding the nuclear bomb out of the bomb bay down onto the target came after this event.

The Soviet Union was the cold war enemy and the people of this country generally accepted the hazards that accompanied nuclear deterrence. As a result, nuclear incidents came and went without being the feature story of the day and lawsuits were rare. AH, those "good-old, bad-old, good old days.

The long arm of SAC was the six-engine B-47 jet bomber, the first strategic jet bomber the Air Force bought. There were over 2000 built before the program was completed. The B-47 was only a medium range bomber, so getting from a base in the U.S. all the way to a target in the USSR was not a viable option. As a result, B-47s were forced to deploy to forward staging bases nearer to the Soviet Union, especially when world tensions heated up.

The U.S. maintained such bases completely circling the USSR. If we were to actually launch a nuclear attack, the B-47s would launch from those forward-staging bases to their assigned target. B-47s sat on alert, loaded and cocked, ready to launch.

These bases provided the bare minimums such as a runway, parking hardstands, very little maintenance capabilities and there were no nuclear weapons stored on these bases at that time. As a result, we loaded the B-47s with nuclear weapons at our home base before we deployed. When the B-47s launched to these bases, they were preceded and followed by maintenance and logistic teams to provide the necessary maintenance and servicing to prepare the aircraft to launch to their assigned targets or return home.

When these deployments occurred, we never knew, until we got the word to launch the aircraft back home, if we were actually going to war or not. Nuclear war seemed a very likely possibility in those days. International tensions were high and we were living on the brink. It was not unusual then for SAC to mobilize and deploy its forces at the direction of the U.S. President. Then, after standing on alert for a time at the forward bases, negotiations would prevail and the crisis would subside. We would re-deploy to our home station and continue our normal operations getting ready for the next world crisis to send us scrambling.

In SAC we were always dealing with no-notice alerts. At that time we didn't have aircraft sitting on an alert strip like we did in later years. When an alert was called, we stopped what ever we were doing and generated every aircraft to combat ready status and loaded it with nuclear weapons. At that time, SAC B-47 bomber crews were required to fly a number of hours with live nuclear weapons onboard to remain qualified as combat crews. Old Mark 6 A-bombs were huge. Some looked like a giant top with fins and one bomb filled all available space in the bomb bay of

the B-47. There were even indentations in the bomb doors to accommodate the tail fins of the bomb.

As a safety factor, the fusing or triggering device was carried onboard the aircraft separate from the bomb during takeoffs and landings. This was a cylinder about two feet long and about six inches in diameter. A web-strapping sling in a tubular metal alloy frame suspended it. It was carried in the cockpit by the aircrew during takeoff. After the aircraft was airborne, the Bombardier/Navigator (Bomb/Nav) had the unpleasant duty of having to take this device to the bomb bay and install it in the bomb. He was required to travel a precarious route by opening the inner hatch to the pressurized crew compartment. Then he had to drop down into the crawl way while hoping the latch on the outer hatch held so that he didn't fall out into the wild blue yonder. This required negotiating a ninety degree turn from the entrance hatch area into the crawl way that led to the bomb bay. All this while carrying a triggering device that was so delicate that is was held in a sling. Once in the bomb bay, the Bomb/Nav had to install this device in the atom bomb to make it ready. After the device was loaded into the bomb, it could be armed from the cockpit if the order was given to proceed to the target.

The area that the Bomb/Nav had to work with in the bomb bay was precarious at best. His was a most unenviable job. He stood on a small catwalk and leaned against the bomb to do his work. The catwalk was spring loaded to the up and stowed position and had to be manipulated with the feet. Old B-47 Bomb/Navs reading this can provide more accurate details of this operation. Suffice to say it was an extremely difficult operation made ever more precarious if the aircraft happened to hit turbulence while he was going about this dangerous task.

During a maximum effort deployment out of Hunter AFB, GA, both the 2nd Bomb Wing and the 308th Bomb Wing had launched all if their loaded B-47s to a forward staging base. C-54s from Charleston, SC had picked us (maintenance crews) up to deploy to the forward staging base as well. The C-54 I was on experienced engine trouble and had to lay over in Bermuda on our way the Lakenheath England where our B-47s had deployed. During that layover, I recall waking up one morning, feeling somewhat worse for the beer, long hours preceding an actual deployment, and sore from sleeping in a chair in the air terminal. I wandered over to the snack bar to get a cup of coffee. I picked up a copy of the local daily paper as well. That's when I almost choked on my coffee. The headline read, "A-bomb Dropped on South Carolina".

It doesn't take a great deal of imagination to visualize what went through my mind. Headlines like that during a SAC deployment in the "fifties" was a real heart stopper. Then I continued to read and discovered that a B-47 from the 308th BW out of Hunter AFB, GA had accidentally dropped an atom bomb on South Carolina.

The bomb was dropped in a semi-rural area, right into a family's yard. There was considerable damage to a dwelling, cars, and other property. There were personal injuries but no fatalities. The TNT charge in the bomb had gone off but there had been no nuclear explosion. The bomb had not been armed.

When we finally reached Lakenheath England, we were briefed on the incident. We were told that while the Bomb/Nav was in the bomb bay loading the fusing/triggering device, the aircraft hit some turbulence throwing him off balance. Instinctively, he reached to grab something to keep him from falling down onto the bomb doors and possibly out into the atmosphere. The first thing his hands latched onto were cables in the top of the bomb bay that ran to the bomb salvo valve. His weight pulling on these cables was enough to activate the salvo system, suddenly opening the bomb doors, and dropping the bomb onto U.S. soil while he hung suspended over an open bomb bay. One can only imagine the thoughts that must have been going through his head at the time.

Sort of reminds me of that scene from the movie "Dr. Strangelove", where the B-52 commander rides the bomb out of the bomb bay. But, this one was on U.S. soil.

Giving credibility to this scenario, we were required to perform an emergency Time Compliance Technical Order (TCTO) prior to flying our B-47s with a nuclear bomb onboard. The TCTO consisted of installing rigid tubing around the salvo cables that ran through the top of the bomb bay. These cables normally were not guarded. These were the cables that the unfortunate Bomb/Nav grabbed. The tubing was designed to support weight without activating the salvo mechanism.

Later that year not far down the road in Darlington. S.C., "Fireball" Roberts won the Darlington 500 driving a '57 Chevy. General Curtis LeMay was Commander-in-Chief of the Strategic Air Command (SAC), J. Edgar Hoover was running the FBI, '57 Chevy's and Thunderbirds were all the rage, and Dwight Eisenhower was President of the United States. People in the U.S. trusted their government and military (wow! what a concept). When the government said something, it was generally accepted as Gospel. Five months later the Air Force paid the Gregg's $54,000 in compensation. No more was heard of the incident.

A Comedy of Errors

By Lt. Colonel Allen C. Hart, USAF (Ret)

In the summer of 1954, I was the Chief of Maintenance for the 310th Bomb Wing stationed at Smoky Hill AFB, Salina, Kansas. We had been flying the Boeing

B-47 for over a year and were almost combat ready. Our crews were still relatively new to the B-47, and let's admit it; the B-47 was not the easiest airplane to fly. On this particular day, I had just arrived at my quarters, which were only a mile or so from Base Operations, and was seated at the dinner table when the phone rang. Any time the phone rang, I expected the worst. This time was no exception. The tower was on the phone and the message was, "One of your airplanes is just running off the end of the runway!"

I didn't even bother to hang up the receiver. Making a mad dash for my car and driving at a speed well in excess of the speed limit, I arrived at the fire station in time to catch the first truck heading for the crash scene. The ship was about half a mile from the end of the runway and in the middle of a wheat field. We could see the smoke and flames just beginning to emerge from the mid-section of the fuselage. As the fire truck approached the ship, we could see that the fire was on the opposite side from our direction of approach and there was no way to reach the flames because of a six-foot deep ditch between the plane and us. I jumped off the truck before the driver headed off to the right in an attempt to find a way to cross the ditch. A couple of hundred yards away, he was able to cross and could reach the plane from the side where the fire was located.

By now the fire was really pouring out of the plane. It was being fanned by the engines, which were running at full power. I managed to reach the cockpit door and climbed into the plane. I shut down all six engines and tried to exit by the canopy, but it was jammed half open. There was not enough room to get out that way, so I exited by the door. Something was wrong here; I was alone in the airplane. No evidence of any crewmembers. I began to hunt for bodies when I heard someone say, "What are you looking for, we're over here?" The pilot and copilot were sitting on the bank of the ditch having a smoke, but the observer was nowhere to be found. After some yelling and searching, he was located further up the ditch casually watching the airplane burn.

I went back to where the pilots were sitting and asked the pilot why there was no drag chute. He said the he had pulled the release handle and nothing happened. Being the Chief of Maintenance and being conscious of my responsibility, I crawled under the fuselage and located the drag chute door. Sure enough, the door was open but the chute was not deployed. Since the flames were now getting out of control, the Fire Chief made me get way back from the airplane, so I couldn't do any more accident investigation work at that time. We were all most fortunate that I was able to do what little investigation that I had done. The plane was a total loss and was consumed by the fire.

I was fortunate, or unfortunate enough, to be on the Accident Investigation Board that had the responsibility for determining the cause of the accident. To the

best of my recollection, this is the story as told by the aircraft commander. "We were returning from a routine mission and were preparing to land. The approach was made as normal and the handle was pulled to deploy the drag chute. I thought it came out. As we crossed the runway threshold, the tower called and said that we were landing long. I glanced out of the canopy and saw that we were passing the first quarter of the runway. I pulled back on all six throttles and tried to put the plane on the ground. We touched down hot but not hard. I got on the brakes and told the copilot to help with the braking. We slowed a little, and then the brakes had no effect. We were passing the middle of the runway and I decided to go around. Too late, there was no way that we could get that thing off the ground. I put it back down and pulled off the power. We were now passing the end of the runway. I hit the switch to raise the canopy and just as I did, the copilot hit the emergency canopy eject. The canopy rose a couple of inches and the grasshopper arms froze. The canopy would not go up or down. By now, we were past the runway overrun and were headed for the wheat field. The ride was a little rough, but not bad. I figured that the best thing to do was to set up a big wide turn and let the soft dirt slow the aircraft. To help the turn, I pushed up the three right-hand engines to full power and chopped the left engines to idle. We were turning nicely when I saw this iron railroad track rail rising up from the wheat field. I knew that if I hit it there wound be hell to pay so I tried to turn away from it. That's when we hit the ditch. I never saw it coming. When the ship hit the ditch, it broke just behind the wing and smoke started coming out. I figured it was time to get out of there, so the copilot and I went out the side door. Neither of us saw the observer leave, he must have beat us to the door. The copilot and I went over to the bank of the ditch and lit up a cigarette. That's where we were when Major Hart found us."

The board found no indication that maintenance was a cause of the accident. We did find that a material failure of the brake pads was a contributing factor and that a design flaw in the drag chute operating mechanism was also a factor. The pilot had properly placed the cable ball in the door key slot, but the slack in the cable allowed it to pop out as the door closed making the chute undeployable. The operation types on the investigating board tried to say that it was pilot error, but the landing was within prescribed limits. Had the chute deployed, or the brakes worked, the landing would have been routine. This comedy of errors resulted in the loss of an airplane, but no injuries. We put out an emergency fix on the chute door that included a latch for the cable, and I never heard of another airplane having this trouble.

An Unusual B-47 Activity

By Major General James P. Smothermon, USAF (Ret)

After completion of Aviation Cadets in February 1956 (class 56-H), I was assigned to Pinecastle AFB in Orlando, Florida as a copilot flying B-47s. After about two years I gained enough flying hours and experience to upgrade to Aircraft Commander and was credited by the Air Force Times as SAC's youngest aircraft commander at age twenty-three. As my crew gained experience and sharpened our skills in celestial navigation, air refueling and radar bombing among others, we attained Lead Crew status.

During that time we did our air refueling with the KC-97, but in 1961 SAC began to employ the KC-135. On 14 September 1961 my crew was scheduled to refuel from our first KC-135. The tanker was flying out of Ramey AFB in Porto Rico and we were out of Orlando, now McCoy AFB. Our refueling area was about halfway between Ramey and Miami at FL 28.0. Following a head-on rendezvous and rolling out behind the tanker, I moved into position and locked onto the boom. Boy was this much easer than refueling behind the KC-97! After about five minutes the tanker called for an emergency breakaway and I immediately backed off and much to my surprise, the tanker extended his gear and started a rapid descent. I decided that I would follow him, as he continued his descent to ten thousand feet. As he leveled off he advised me that he had suffered an emergency decompression and would remain at the lower altitude to continue his mission to Fairchild AFB. Then he determined that at this altitude he wouldn't have enough fuel and would need to divert to a closer base in route. This was a major problem for him as he was representing his unit in the 1961 SAC bombing and navigation competition at Fairchild.

We had been scheduled for a lengthy mission and had a full fuel load including full wing tanks. Remembering that it is possible to "reverse refuel" from the B-47 if you pressurize the main fuel manifold from the wing and auxiliary tanks, I advised the tanker that I had the capability and was willing to give it a try if he was. And he was! I turned on the boost pumps in the wing and aux tanks and moved into position on the boom. My copilot opened the manifold valve and sure enough it worked and fuel started going up the boom. We continued along the route over Miami and toward Orlando. The transfer was slow but after about forty-five minutes the wing/aux tanks went dry and I dropped off of the boom over Orlando, called the Wing Command Post and advised that we were landing early.

The tanker pilot was able to continue his flight to Fairchild and in fact had the good fortune of taking first place in the tanker competition. The tanker pilot was the Commander of the 915th Air Refueling Squadron and was kind enough to send

me a very nice letter of appreciation through command channels, which was made a matter of record in my Crew Professional File. This took a little steam out of my commanders concern about the early landing and my assignment to fly the B-58 followed shortly thereafter.

Bail out! Bail out!

By Captain Joseph M. Harter, USAF (Ret)

If you have the idea that accidents always happen to the other person, discard it. Accidents are no respecter of persons and when you are in an emergency situation, which calls for bailing out of an aircraft, you find this out the hard way.

At the time, I had been sent TDY to Forbes Air Force Base for aircraft commander upgrading. With the usual ground school preparation completed, I eagerly started the flying phase and found the first six missions in the B-47 to be very routine. On the seventh mission, however, the routine was left at home plate.

Our instructor, another student pilot, a crew chief and I took off on a refueling jaunt in an RB-47E. We were proceeding to our refueling area when I noticed two amber power control unit lights glowing to my right, indicating a malfunction in the hydraulic boost of the ailerons. Believing the instructor pilot may have been "testing," as some have done, I asked him to check all circuit breakers. When he told me they were all in, I explained my trouble.

Our next step was to follow the Standard Operating Procedures and call the Command Post to advise them of our difficulties. Apparently, we were out of radio range, as the Command Post could not be reached. We then contacted our tanker and asked them to call. Still no luck. We continued our mission and chased our tanker around cloud formations for a short while.

From the corner of my eye I noticed a red light come on that was beside one of the two amber lights. I notified the instructor pilot and we made an immediate disconnect from the tanker. The malfunction was not difficult to diagnose; it definitely meant a control problem that we could not remedy in the air. I relinquished control of the aircraft to the instructor pilot and received clearance from Kansas City to return to home plate, while the third pilot figured our optimum altitude to be 35,000 feet. We realized we could not stay in the clear at this altitude because of a cirrus deck of clouds, but without a navigator aboard to operate our radar it was impossible for us to know that on the other side of the cirrus clouds was one of Kansas' typical thunder bumpers.

The aircraft started to vibrate from the turbulence. It became more violent, too violent for cirrus clouds! I stared at the instruments: altitude, about 35,000 feet; airspeed, oscillating between 220-240 knots; attitude, right turn, then a sharp left turn. I looked in the mirror that was focused on myself. "Harter," I said, "remember, this type of situation always happens to the other person." I should have saved my breath. At this moment the instructor pilot was turning the aircraft to head back on our reciprocal course, and I realized that any time we could lose complete control of our aircraft.

The turbulence became unbearable. I noticed the attitude indicator go crazy, ninety degrees of bank, then 135 degrees of bank in the opposite direction. The instructor pilot was trying desperately to talk to Kansas City about our situation: "Kan-Kansas City, we're in a spin, we're in a spin!" In the same breath: "Bail out, bail out! Depressurize! Depressurize!"

I will never know how long I took to squeeze the trigger, but evidently not too long. The canopy departed and I followed. But to this day, I do not remember squeezing the trigger. There was an unknown number of seconds that had departed my life, because I had blacked out during my ejection. I did not have the time to think out a decision when I regained consciousness; in fact I am still vague about the act of opening my own parachute.

The opening shock made me pass out again. After a few seconds I realized I did not pull my bailout oxygen bottle. Frantically I pulled at the green apple and managed to sever the line. With a significant sigh of relief, I started to think about other problems, and found one quick: I had lost my helmet from the windblast so my oxygen bottle did not help. From my training I feared that soon I would get hypoxic since I had no idea of my altitude. Moments passed, but I did not get the symptoms of passing out. I realized then that I was it least low enough not to suffer from hypoxia.

I was still trying to survey my situation but the numbness from the bitter cold dulled my senses. I wrapped a scarf around one hand in an effort to stop possible frostbite. The sky was filled with white swirling patches of clouds and thunder roared with deafening pitch around my bare head. The shroud lines of my parachute were snapping from updrafts and downdrafts. I was swinging like a pendulum on a grandfather's clock, not knowing when I would stop oscillating. In between my thoughts, I prayed like no man has ever prayed. Words came to my mind that I didn't know existed. I could only hope if God ever answered my prayers, please let it be now.

Soon I knew my prayers had been answered. For the first time since I hit the silk I knew I was descending. I finally broke through the overcast and calculated the ground to be 3000 feet below.

Now I was faced with further problems. Where am I going to touch down? The area was sparsely populated but the small towns passed by very rapidly. I was moving horizontally much faster than vertically. This situation made it extremely difficult to decide my impact with the ground. I tried to judge carefully, from my line of travel, the possible area of landing. Time was growing short. My descent was faster than I had judged it to be. My decision on possible areas of landing could not have been more undesirable if I had had time to judge them, a farmer's cattle drinking pond or a small forest of irregular looking trees.

Frantically, I tried to remember my survival training on how to juggle the parachute risers to land in a predetermined site. It didn't work, for I was too weak from fright and panic to manipulate my hands correctly. Due to the violent winds, the rate of descent became faster than the rate reckoned with in our training. I was suddenly submerged in smelly, stagnant water. After a few sickening swallows of water, I came to the surface. My parachute canopy was still billowed from the fast moving wind. Gliding on the surface of the pond I reached for my harness quick-disconnect. Simultaneously the canopy deflated as it struck a wharf in the pond. Even though I was in shock, I distinctly remember spending fifteen minutes of hell under an orange and white canopy of silk.

My panic and fear very slowly began to subside. I was able to stand on my feet while I proceeded to unhook my harness. But because of my unstable legs, I fell down numerous times, again swallowing more stagnant water. I struggled breathlessly to reach the shore, falling, swallowing more water. Only ten steps were needed to reach the shore but I must have taken thirty. Lying exhausted, trying to regain my strength, I said another prayer of thanks.

With effort I managed to stand, but not too erect. I looked about my surroundings deciding which direction to travel. All I could see in the distance, silhouetted by brilliant flashes of lightning, were a few cattle. I remember hoping the herd did not include an angry bull, for in my weakened condition I could not have outrun a turtle. To my surprise, I stumbled in the right direction, as I met a vehicle along a nearby dirt road. The occupant of the car had noticed my descent and had driven in my general direction.

When we arrived at the hospital, I was asked if I needed a wheel chair and I bravely uttered no. It wasn't until I was inside the hospital that the full impact of shock struck me. I began shaking so terribly that it took four people to undress me. I learned a short time later that the crew chief and I were the only survivors.

I am not necessarily a superstitious individual, but this accident happened on the 13th day of the month, at 1300 hours, and I was assigned Room 13 in the hospital. Another 13 and the men in the little white coats would be asking for me.

This story was originally published in SAC Combat Crew Magazine, July 1963 and is reprinted by permission of the author.

Everglades Bailout

By Lt. Colonel Maury E. Saunders, USAF (Ret)

Spring 1960. This flight was a night heavy weight refueling and extended Bomb-Nav leg. I do not recall the projected duration, however it was probably pretty long. I was a newcomer at Homestead, having arrived from a two and a half year assignment in current operations at 8th A.F., Westover, Mass.

My crew was new and had not been on combat crew status before my arrival. We had only a few flights together prior to the check ride, (which happened to be a Standardization Board ride). My copilot that night was a very sharp Captain from Standboard. My regular copilot wanted to ride in the aisle but his request was refused, boy I'm glad.

Take off was after dark. We climbed westward and refueling rendezvous was immediately after reaching 21,000-feet to hook up with a KC-97 and refuel west bound over the gulf. All went well and refueling was as normal as it can get on a KC-97 going heavyweight!!

After completion of refueling we dropped back, cleared the tanker and made a right turn to start our nav leg. We were trimmed up in a climb when #5 engine exploded with a forty-foot (estimate) blue flame extending forward out the intake. The #4 engine began flaming and I shut down both of them, however, in the process (I have big hands), I think I shut down #3 at the same time. Probably, during the first 10-20 seconds I was able to communicate with the crew but after that we lost everything. One thing that I remembered from emergency procedures, "Failure of a turbine wheel can cause loss of interphone and all communications due to fragments at more than 3000 degrees Fahrenheit penetrating the bomb bay and fuel tanks!"

I hit the bail out bell and when I heard the navigator eject (downward), I pulled my handles. The copilot and I must have gone out at the same time. Due to trying to keep the aircraft level, when I ejected, I hit the left cockpit rail, knocking myself unconscious and banging up my left leg. I don't know what our altitude was when we ejected, but it was probably close to 28,000-feet. At any rate, not knowing how long I had been out, and not being too trustworthy of the aneroid on my parachute, I pulled the "D" ring, thus ripping about every other panel out of the chute (I'm 6'3" weighing 220 lbs.). As the saying goes – Too high, too fast!!

I wasn't really certain if we were still over the gulf of western Florida. I took off my hard hat and hollered my head off to see if the other two-crew men could hear me, but there was no response. Interestingly enough, I almost let my helmet drop, but suddenly remembered when in Korea about an F-86 jockey who bailed

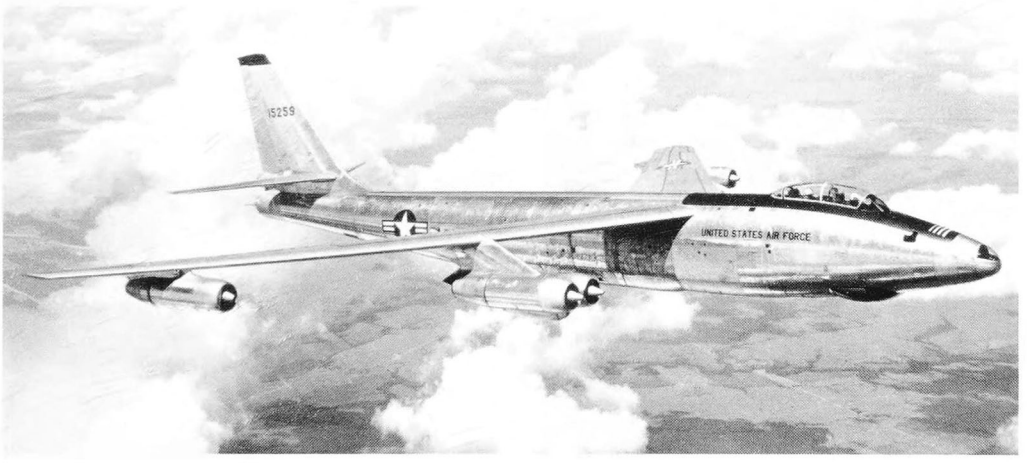
B-47E (s/n 20164) in flight.

Aerial refueling allowed the B-47 to become a long-range bomber.

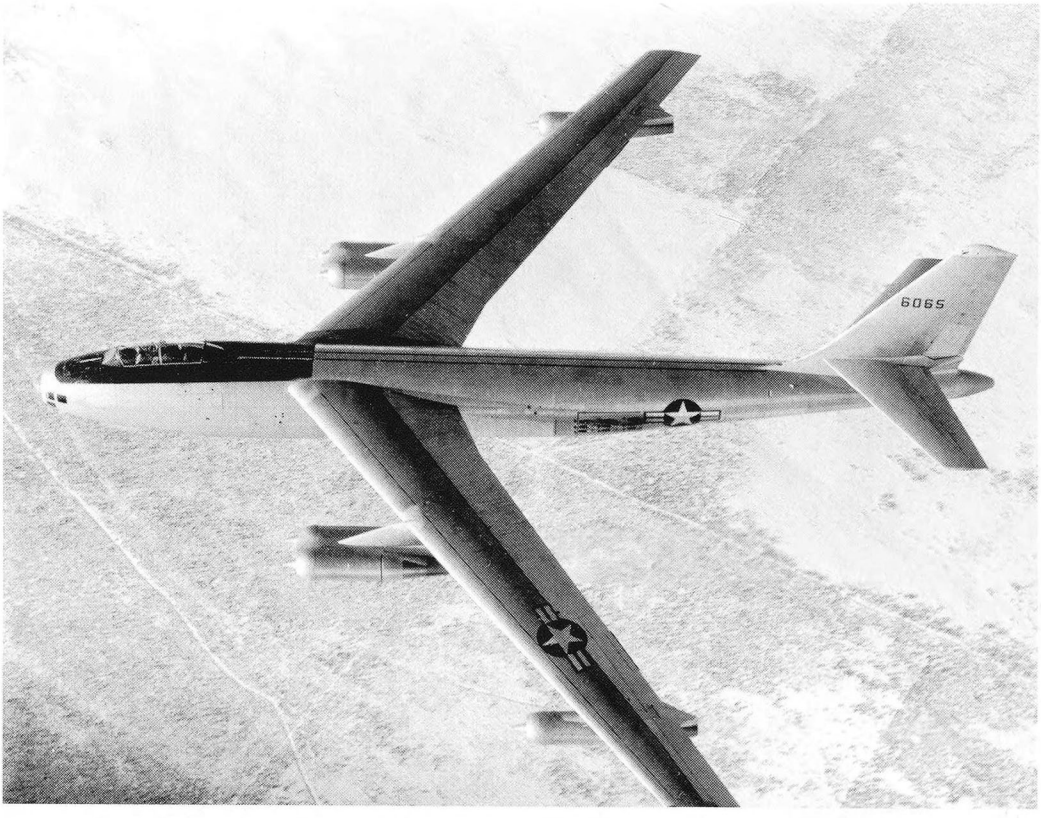
Climbing aboard a B-47E.

A B-47B (s/n 12047) of the ARDC. Note long bomb bay doors

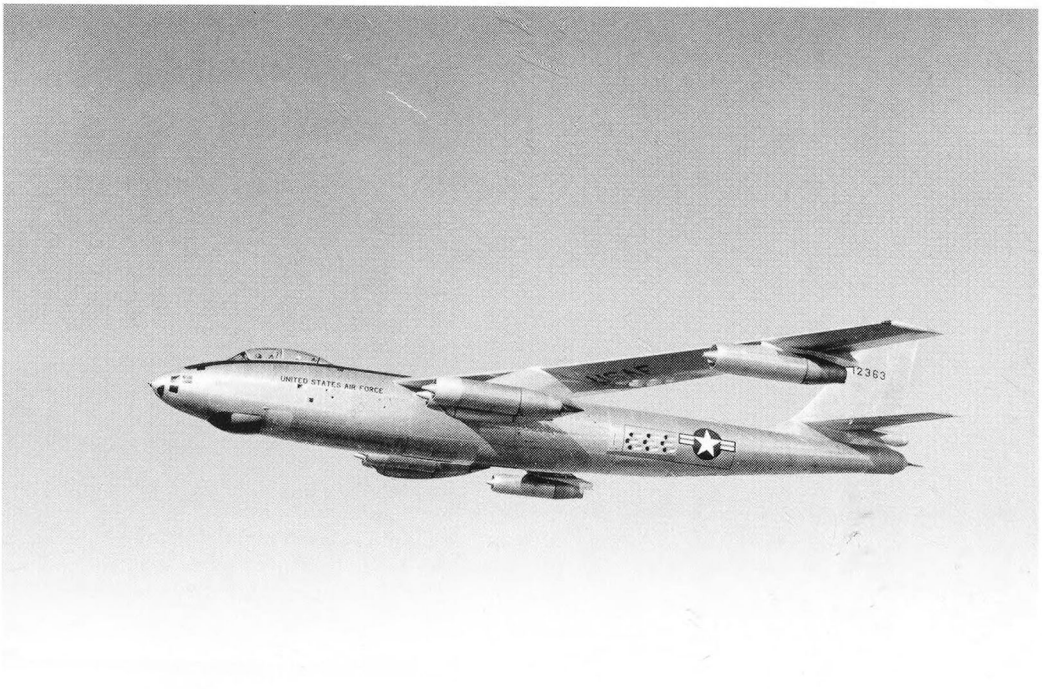
Relaxing at the alert facility at Sidi Slimane, Morocco.



The sleek lines of an RB-47E (s/n 15259) in flight.



Overhead shot of the first XB-47 (s/n 6065).

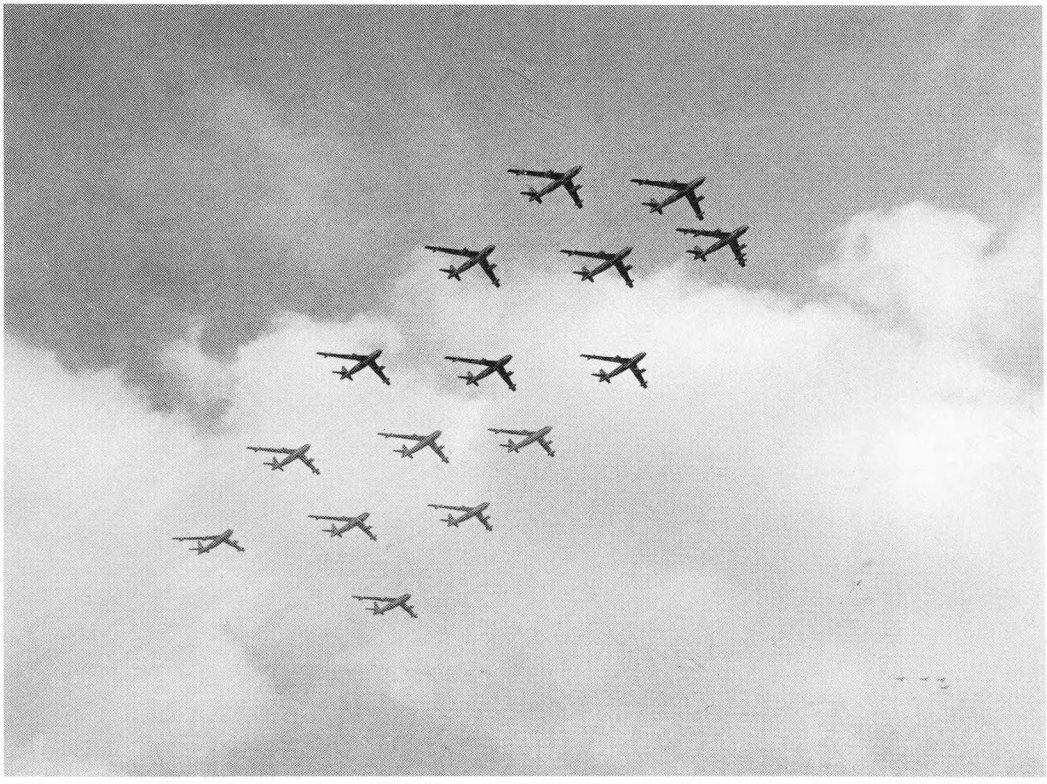


A B-47B (s/n 12363) in flight.

A WB-47E (s/n 017066) of the 9th WRS.

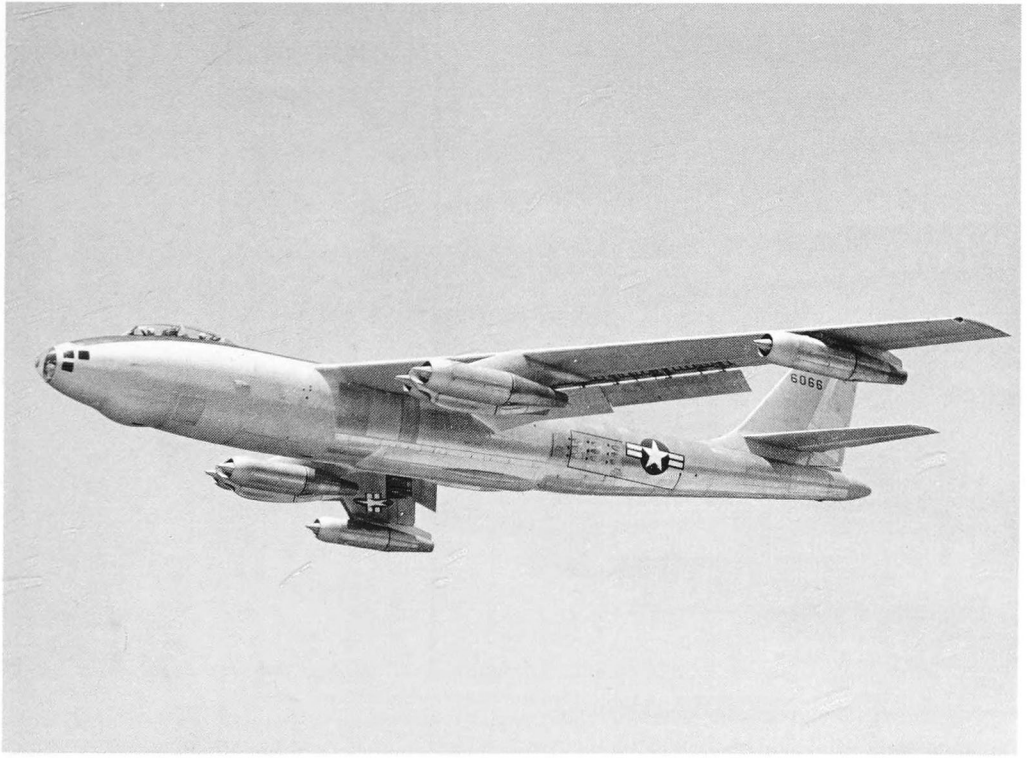
Smokey XB-47 JATO take off.

B-47A (s/n 91901) sporting B-52 landing gear prepares to land.

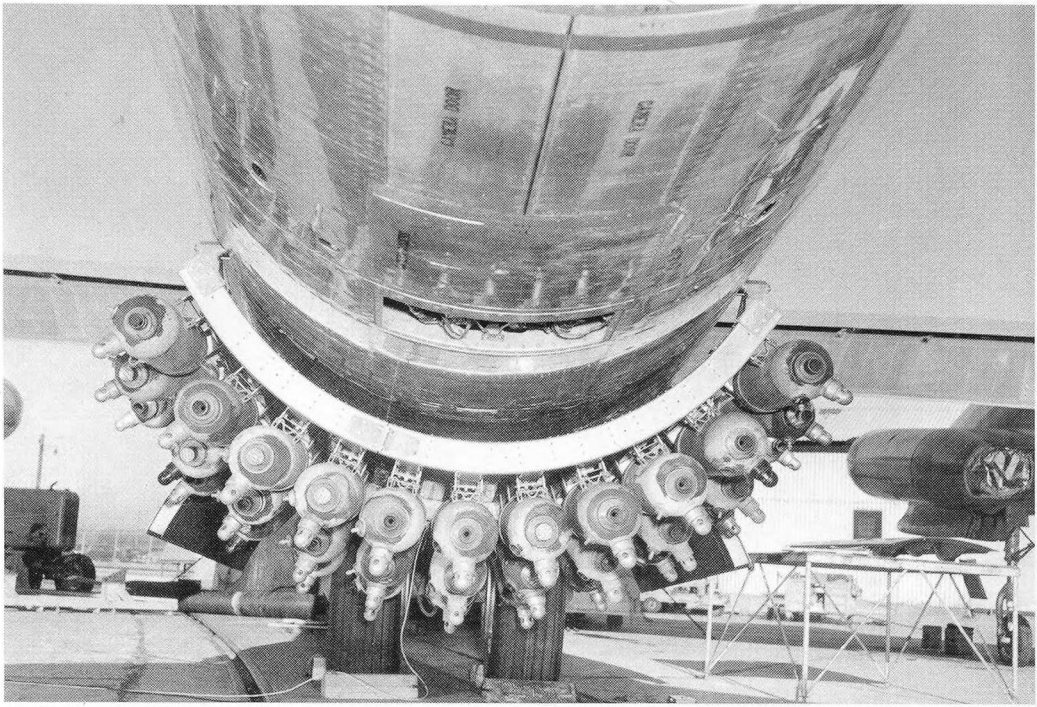


Tight formation with 15 B-47's.

Meeting the replacement crew at Sidi Slimane.



The second XB-47 (s/n 6066) with modified bomb bay doors.

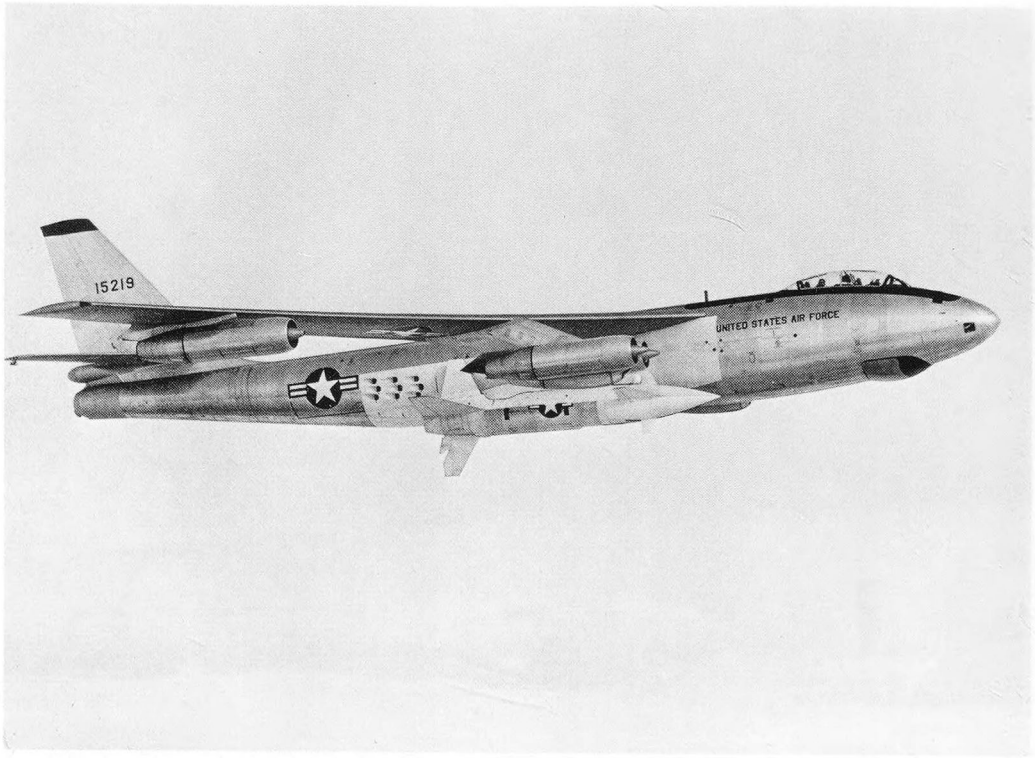


Rear view close up of the 33 bottle ATO configuration.

Right aft view of 33 bottle rack mounted ATO bottles.

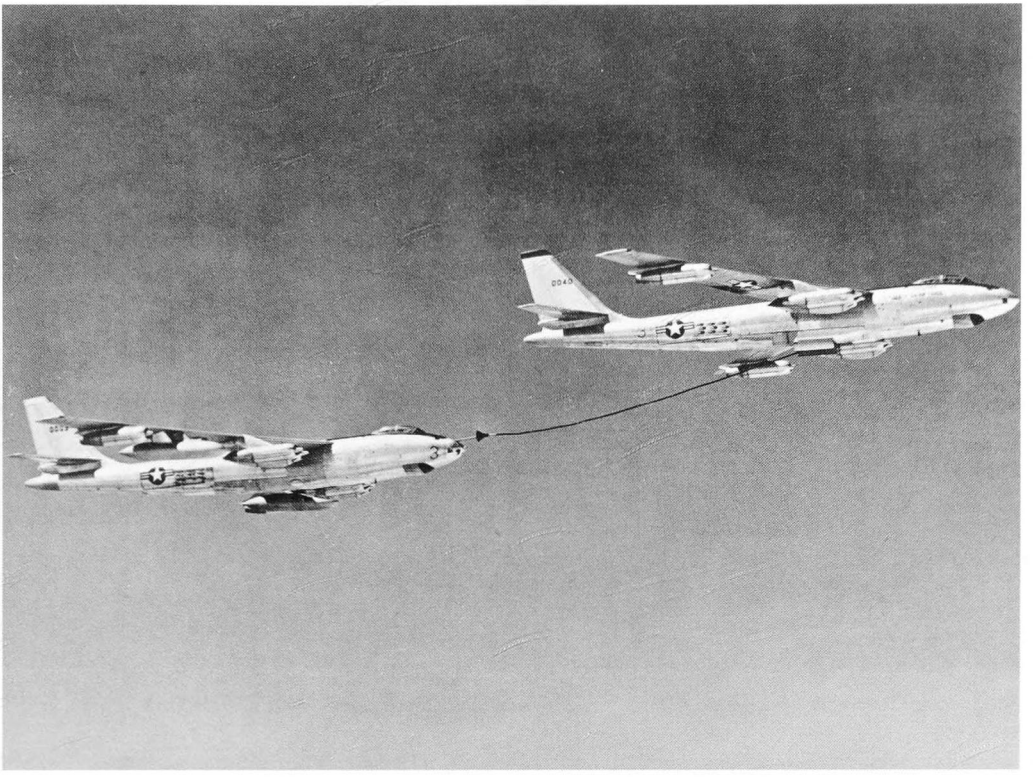
The 2nd Wichita built RB-47E (s/n 15259) flies along side a B-47E (517043).

An RB-47H on the ramp at Boeing's Wichita facility. Note various access panels removed and refueling doors are open.



A YDB-47E sporting a GAM-63 Rascal Missle.

A TB-47B with J-57 outboard engines.



The YB-47F receiver and KB-47F tanker aircraft.

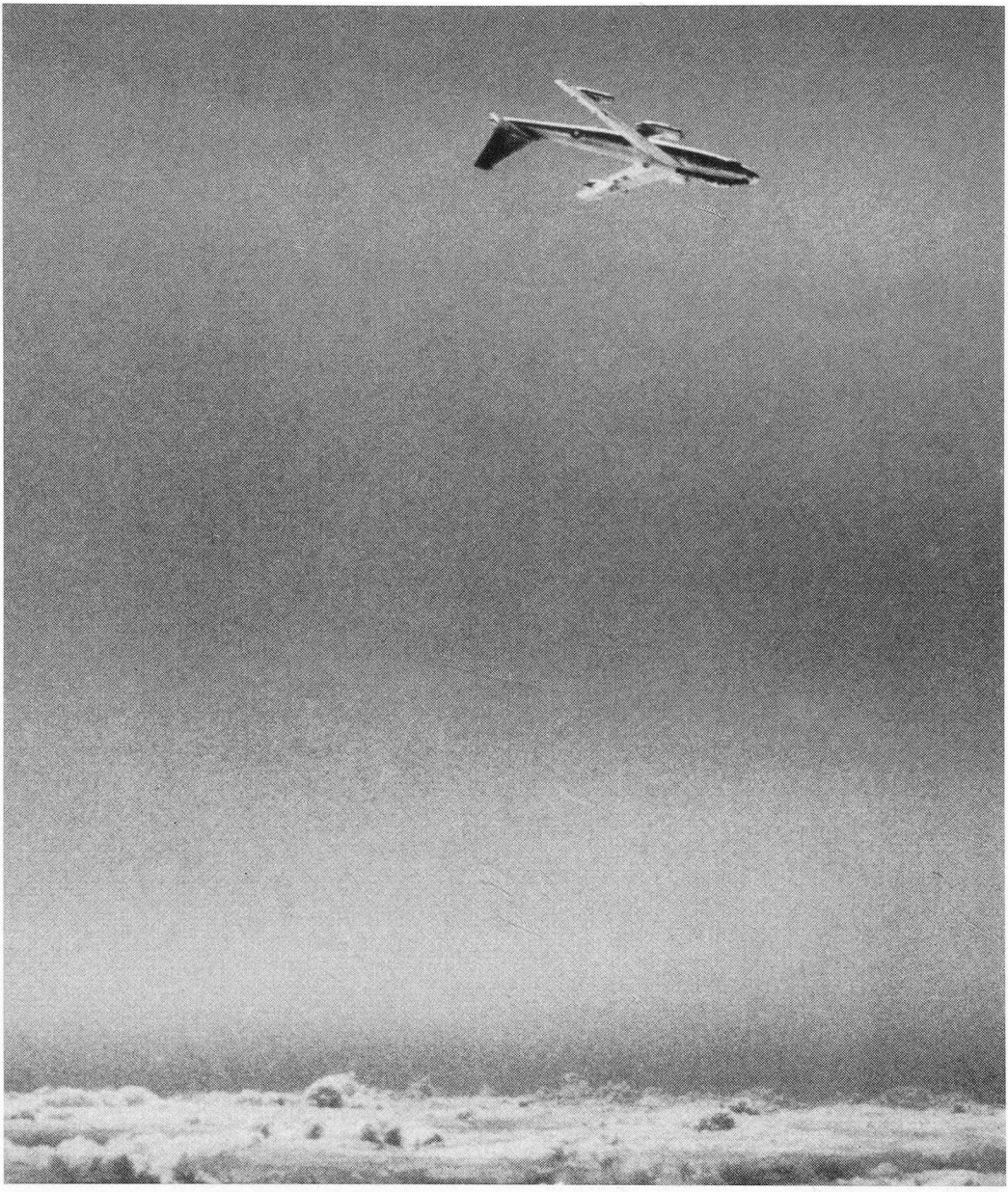
A B-47 with 4 Cross Bow missles.

Robbins and Osler after a taxi test in the first XB-47 (s/n 6065) in December 1947.

XB-47 #1 (s/n 6065) taking off from Boeing Field, December 17, 1947.

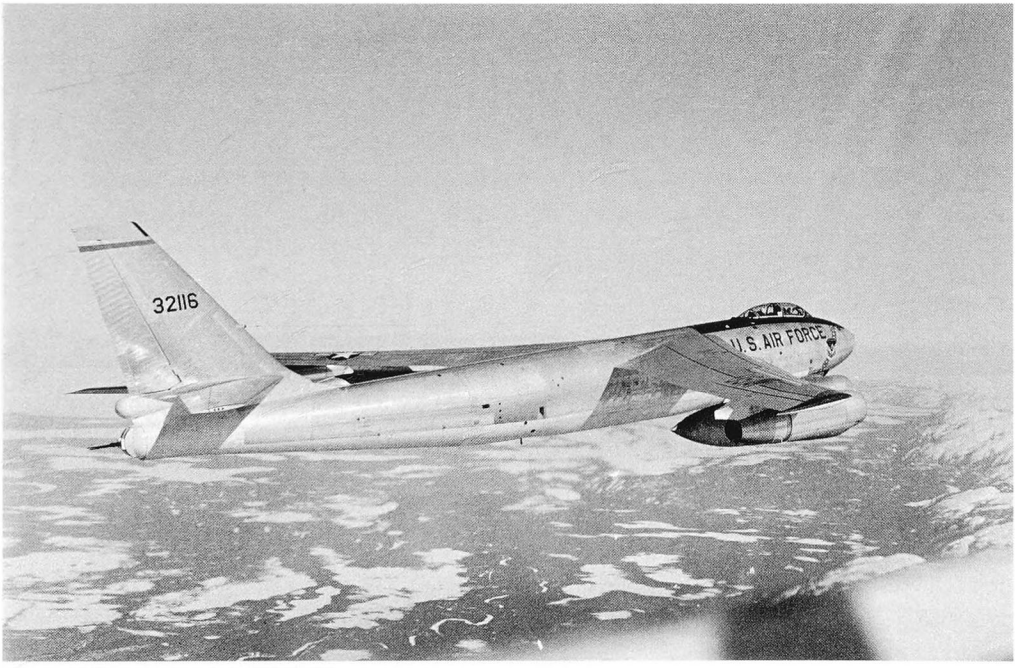
Boeing Test Pilots Robert M. Robbins and Scott Osler in the cockpit of the #1 XB-47.

Boeing Test Pilots Dick Taylor and Jack Funk kneeling in front of a flight test aircraft.

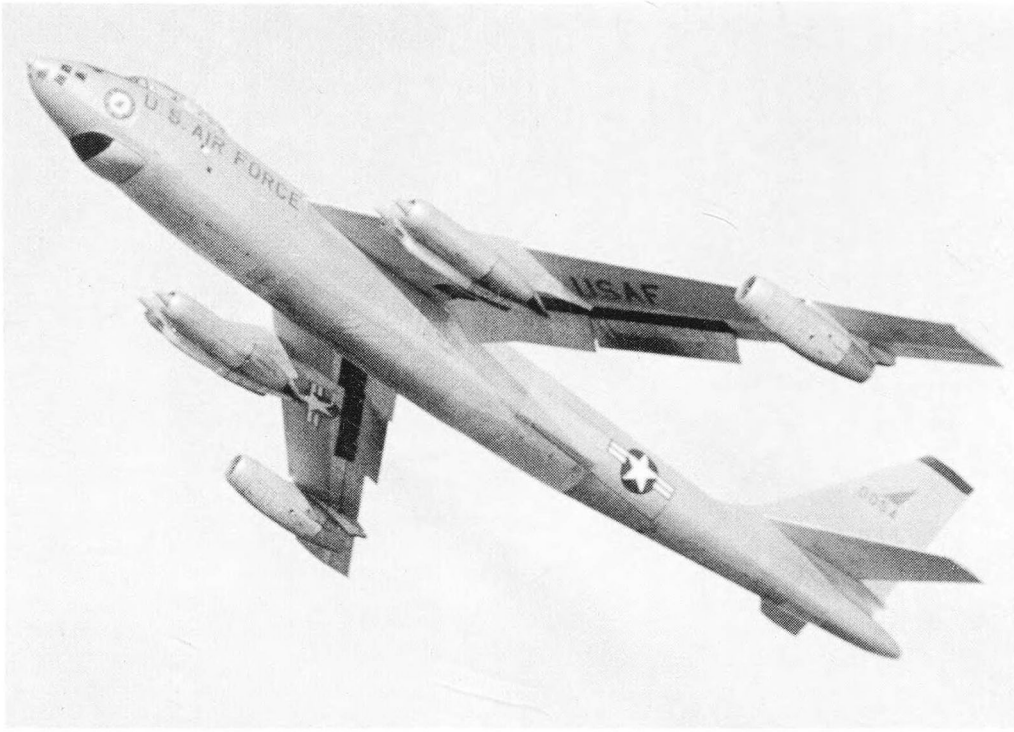


A B-47 performing the LABS maneuver.

The "CL-52," A B-47 operated by Canadair while testing the Orenda Iroquois turbojet engine.



On route to England, this B-47E (s/n 32116) is seen over Goose Bay, Labrador.



A B-47B (s/n 50054) of the Wright Air Development Center (WADC) equipped with J-57 outboard engines.

Downward ejection seat tests July/Aug 1954 at Eglin AFB. Lt. William Campbell 2nd from left, Capt Jesse Jacobs 4th from left Colonel AM Henderson kneeling, Capt Ed Sperry on Hendersons right.

out, took off his helmet, dropped it and was communicating with people on the ground. He landed safely, but the wind was blowing pretty hard and dragged him into a rock, which struck him in the head killing him. I am grateful to people who passed that information around. I put my hard hat back on and buckled it up!!

I landed on my head on a tiny island about fifteen feet square in the everglades. I was knocked cold and must have been out for a while. After coming around, in a typical reaction, I gathered my gear and immediately took off. The water was too deep, and after several swarays I gave up trying to get off my little island and sat down to think (for a change). I could hear cows (or bulls) making noises so I figured I must be near a farm. To my chagrin, I later found that these were alligators in the midst of breeding season!

With my brain beginning to function, my radio from the survival pack and a few flares, I was picked up by a Coast Guard Helicopter that hovered over my island while they hauled me in. I was taken to a small town dispensary where my navigator had already been brought. Due to not hanging on to his "D" ring for the downward ejection, both of his shoulders were broken – otherwise, all one hundred and forty-five pounds of him were all right. Post script – he resigned and never flew again.

At this point, my big concern was for our copilot Standboard guy. They couldn't find him. By daylight the next morning, however, at around 10:00 they brought him in on a stretcher. His head was like a basketball, gray and dead looking. He was alive. Upon bailout and on the way down, he had released his one-man raft, (which was hung on a strap about 25 feet below him). His parachute breast buckle must have been turned because it broke his sternum, thus making it impossible for him to raise either arm. Miraculously, his raft landed right side up and he fell into it face-up. It drifted under the branches of a large tree, which made it difficult to find him. The mosquitoes chewed on his head all night and until he was found. We all came out smelling like a rose with thanks to God.

Aftermath. After a few Reflex Missions to North Africa, I got a job as Commander of the 99th Bomb Squadron at Mountain Home, Idaho. One year to the day after our bailout in Florida, I was flying a night mission with one of my crews and while refueling we flipped off the boom and had some truly exhilarating gyrations due to a control problem. We came close to bailing out again. However, the "Great One Above" took us in his hand and we burned our fuel off and landed without a problem.

Aluminum Cloud

By Lt. Colonel Hank Cervantes, USAF, (Ret.)

I am reminded of an incident that occurred one day while I was up checking out a new B-47. My copilot was 2nd. Lt. Smith Swords III and up front Captain Whitford Fletcher was reading funny books while waiting to test the bomb/nav. system. Smitty said, "Hey, Hank look at the aluminum cloud coming our way."

I said. "Let's have some fun." I circled to let the B-36 go by, then overtook him and did a slow roll off his left wing. Fletcher asked, "What are you guys doing up there?" "Ah, Fletch," I said. "I should have told you. We had traffic up ahead and had to take a little evasive action." "Oh, OK," Fletcher replied. "Let me know when you want to start the test." "OK Fletch. I will."

I was still near the seemingly hapless monster and to add insult to injury, I dropped the forward gear and pulled away from him. I then made another 360 and began a standard pursuit curve at him. I was just getting wrapped into it when the B-36 driver displayed the power at *his* disposal. Eight turrets each sporting two twenty-millimeter canons, sprouted from the fuselage and began tracking us. I made a diving turn to get away from the ugly things and as I rolled out Fletch said, "Stop that! You know I get sick when you do acrobatics."

B-47 High Flight

By Colonel Dick Weigman, USAF (Ret)

The Lockbourne AFB I knew was during the period 1954 to 1964. The base was an Air Division Headquarters with two B-47 Wings assigned. Both Wings were equipped with about sixty crews assigned to the four squadrons of bomber aircraft. In addition, a tanker squadron was assigned to each Wing.

When I arrived at Lockbourne in 1954, the other outfit had just phased out of the B-45 and was converting to B-47s. The tanker outfits were equipped with KC-97s. The 26 SRW had three man RB-47E crews. All of the camera equipment was mounted in the bomb bay. Later on the 26 SRW was phased out with the assignment of the 301 Bomb Wing. The 301 Bomb Wing's mission was Electronic Counter Measures (ECM). A five-man crew operated each EB-47E capsule equipped aircraft. A self contained ECM pod was installed in the bomb bay which housed two ECM crewmembers consisting of an officer and an enlisted man. The ECM crewmembers took off in the aisle and transferred to the pod during climb out. After descending below 10,000 ft, the EWO's transferred back to the main cock-

pit. The aircraft was unpressurized during the transfer procedure until they were either safely in their pod or in the aisle.

At the peak of my stay at Lockbourne we had thirty-six aircraft on alert. It took about an hour to recover everyone after a moving exercise. In the 26th SRW, I was assigned to the 3rd, 4th and 10th Reconnaissance Squadrons. In the 301 BW I was assigned to the 353rd Bomb Squadron.

When I left Lockbourne AFB in May 1964, the B-47s were phased out and the Wing was converted to a KC-135 Tanker Wing.

In the Beginning

Oddly enough, my B-47 adventure started in cadets with single engine training. I flew the PA-18 (Super Cub), T-6, T-28 and T-33 (T Bird). Just prior to the April 1954 graduation, our follow on assignments were posted on the bulletin board. My assignment was to B-47s. I had never heard of a B-47 and asked everybody I knew what a B-47 was. I finally found out that it was a multi engine jet bomber. The next question I had was why would a single engine jock be assigned to multi engine bombers? I guess there are a lot of reasons, but to make matters worse, I first had to proceed to Randolph Field for B-29 training. Well what do you do with a single engine jock to give him multi engine exposure? Why, B-29 training of course.

As far as I'm concerned, that was the worse aircraft I've ever flown. An aircraft, which had no cool air, four big engines, a big rudder, they told me repeatedly to use, a large crew, and no ejection seat. To be more direct, while on final approach, they told me to use the @#%*&!@ RUDDER. I was constantly reminded that a B-29 did not turn with ailerons alone. My roommate and I were reminded that if we survived B-29 training we were headed for B-47s at Lockbourne AFB.

When I finally arrived at Lockbourne I was informed that there had been a slight change in orders and that I would attend the KC-97 Field Training Detachment (FTD). Another reason for me to cheer. After spending about three months glued to a chair in the classroom, I was notified that there was to be another change to my assignment. I was to be finally assigned to the B-47 program. Oh boy, did I ever feel lucky. I would have the privilege of attending another four months of FTD training.

I reported to the 3rd Reconnaissance Squadron and was scheduled to complete an in house copilot upgrade program. Before I had the chance to meet my aircraft commander the entire unit deployed overseas for a 90 TDY training assignment. All six of us 2nd Lieutenants were left behind to do typical junior officer duty. We painted, cleaned, did an assortment of jobs and built a squadron mailroom, including individual mailboxes.

As soon as the unit returned from TDY, we were assigned as second copilots to RB-47 crews. I followed my crew around and tried not to get in the way. When the big day finally arrived for me to actually get into the back seat for my first take-off, my aircraft commander (A/C) said, "Put your hands on your helmet and don't touch a thing until we get to altitude and level off." That really made me feel all warm and fuzzy.

My A/C was a great guy but a rigid and exacting individual who dotted all the "I's" and crossed every "T." I followed him around with the checklist and corrected him if he failed to give the exact and proper response. I remember a winter sixteen hour Unit Simulated Combat Mission (USCM) where we were to fly all over northern Canada. My A/C asked the briefer how much of the water in the Hudson Bay would freeze. The answer, "JUST THE TOP."

Suez Canal

Does everyone remember the EWO deployment exercises prior to the founding of the alert force? Crews were expected to maintain a packed bag with all the clothes necessary for a specified time period. We all understand human nature, and SAC crews operated no differently than other services. I can remember receiving telephone calls requiring immediate response. After numerous recall training some crews got a little sick of playing the game. I had a dear friend I went through cadets with who was a tanker troop. During the Suez Canal crisis, our wing was recalled and billeted in the base hospital. We also became a staging base for incoming tankers. The Wing rotated the crews and when I was home I received a call from my buddy. He wanted me to meet him at base Ops. I asked what he was doing here and he said that they were ordered to deploy. He asked me if I could bring along some socks, underwear and a mini shaving kit. I asked him why he needed the stuff. He said that he didn't have any clothing with him. I asked him what happened to the bag he had packed. He told me that all he had in his bags were newspapers. He was tired of hauling out packed bags to the drills and never believed they would ever deploy.

Is There an Instructor On-board?

Later on I was assigned to a Standboard crew. As a Standboard copilot, I was put on instructor orders. I evaluated crew aircraft commanders and copilots in the flight simulator for aircraft emergency procedures, in flight air refueling procedures and crew coordination. We were not in charge of the aircraft when evaluating in flight procedures.

As a Standboard crew we were still assigned to the squadron. I remember an incident when my new Squadron Commander needed a follow on night air refuel-

ing check. A staff pilot naturally needs a crew to fly with so the powers that be decided to put him on the flight orders as the aircraft commander and me on as his copilot. That was a real awkward position to put me in. As a new 1st Lieutenant, I was tasked to evaluate my Squadron Commander's air refueling procedures while at the same time acting as his copilot. He had little B-47 flight experience over and above what he was given in his check out program. By this time I was a highly experienced copilot. My A/C had given me back seat air refueling practice and I felt quite comfortable with the whole situation.

The preflight, take-off and rendezvous were uneventful. The pilot made his first contact and from that point things began to unravel. He fell off the boom and started making the usual figure 8's. After several failed attempts he once again attacked with a vengeance and made a very FIRM contact. He fought valiantly but began to get more rapid disconnects. After one more FIRM contact he surprised me and right in the middle of the contact he said, "You got it!" Remember that I was just a copilot at the time so I cautiously stabilized the aircraft and slowly backed away. I flew formation for a while until he was rested and once again he took control and started the figure 8's once again. At this point a very agitated voice came over the radio and said, "Is there an instructor on board?" I answer immediately with, "Yes!" I was technically correct, but I never did tell him that I was only an instructor copilot. That was an interesting night sortie.

Alert, What's That?

About this time, circa mid-1950s, we started hearing rumors about something called ALERT. There were all kinds of weird stories circulating about what was going on at other bases. We were just a photo-reconnaissance wing, so we weren't in the total loop. One day our crew was called into the Ops office and told that we were the first crew going on Alert and that the wing was starting an ALERT FORCE. A what? An alert force! This came out of the blue. We didn't have procedure one. As a matter of fact nothing was prepared for what we were about to begin. We were told to go home and get a shaving kit and report back as soon as possible. We were told that we were to spend only one night on alert, what ever that was, and would be replaced by another crew in the morning.

We reported back to the Squadron with our trusty shaving kits and were told that they had put three bunks in a vacant building by the water tower and that was to be our home for the evening. The only transportation we had was our own car. We went out to an aircraft, preflighted it and told the crew chief and guard that the aircraft was now on alert, what ever that meant. We had no alert checklist; alerting devices, launch procedures, EWO plan, or anything that was later to evolve.

When morning came we had breakfast and were awaiting the arrival of the replacement crew as the Ops Officer had promised. Instead of a replacement crew he came into the empty building and sheepishly told us that we had volunteered for another day of alert duty, what ever that was. Now remember, we had no change of clothes and no shower. All we had in the empty building was a John with a sink. We were in complete shock over the whole concept. Eventually things became better.

The beginning of our alert force began with private automobiles and no base alerting system. We finally ended up in the BOQ, with copilots sitting at a desk monitoring an open line to the command post. We eventually got a cocking checklist together, received jeeps with alert signs on top and evolved into a modern SAC concept. Our crew had the distinction of starting the alert force at Lockbourne AFB. I continued to gain skills and as a 1st Lieutenant, was selected to under go the Pilot Upgrade Program (PUP).

Pilot Upgrade Program (PUP)

Our upgrade program was strictly in house. The program was loose and not structured. The quality of training depended typically upon the motivation of the pilot and the interest of the individual instructor pilots (IP). However, one thing was evident, all the IP's were very professional and highly skilled.

I'll never forget my first flight in the front seat. All units have their colorful characters and we were no exception. The day prior to my first front seat flight, I did the entire mission planning by myself. I arrived at the aircraft the next day at the scheduled time and waited around for the IP. I was getting concerned and finally noticed someone walking along the ramp toward the aircraft. I finally recognized him to be my IP. He approached the aircraft, smoking a cigar, wearing low quarter shoes and carrying a helmet. He asked me if I had preflighted the aircraft. I said, "NO! I'VE BEEN WAITING FOR YOU." He told me not to worry. He said that all we really needed to check were the tires, fuel and controls. He wasn't much on formality but was a fantastic pilot in the air. He could do more with the aircraft than any other pilot I had ever flown with before. He was a pilot I could envision with a cigar in the mouth, goggles, white scarf, and flying the mail.

Porpoise is Not a Fish

As an aircraft commander, you must insure that the copilot (CP) maintains landing proficiency. This means that the CP has to land from the position of the aircraft, which had the worse view of the runway. He would line himself up with a little help from up front, usually by leaning to the left or right side of the aircraft depending on what felt (comfortable?). As you may recall, whichever side the back

seater looked out of was the wing that usually dropped. The other problem to be faced was the flare. The most inexperienced pilot had to land from the most difficult position in the aircraft. Because the back seater couldn't see up front, he had to judge his aircraft attitude by using all of his pilot skills or lack thereof.

My CP was in need of a landing so I decided to let him make the approach and landing. The final was just fine, on glide path, lined up, rate of descent exact, approach chute deployed, and airspeed under control. As we crossed the approach lights he was lined up pretty good and his descent was just fine. From then on I started experiencing a little pucker time. We were right at the point where we should have started our flare but the CP continued his descent, while aiming the nose straight down at the runway. I told him to ease his nose up and to begin his flare attitude. He immediately pulled back the throttles, and with the engines unspooling, slammed the nose wheel into the runway. Any B-47 jock will tell you that's a NO, NO! We bounced and as we were rounding out in mid-air, on top of the porpoise, I looked to the right and could have sworn we were as high as the tower. I said, "I HAVE IT", and tried to ease the nose back onto the runway without killing ourselves. Here I was running out of airspeed, an approach chute deployed, and no power. Remember, when you needed power, it took the J-47 engine about 12 seconds or so to spool up. On final approach any go-around under about 200 feet required the pilot to accept the fact that the aircraft would touch down before going around.

I finally got everything under control and safely on the ground. I had to get on the binders real hard because the end of the runway was coming up pretty fast. I heard some muffled sounds and shortly thereafter, the tower announced that we had blown a few tires and declared an emergency for us. That's all I needed to hear. I was a relatively new 1st Lieutenant aircraft commander and didn't need that kind of attention. We cleared the runway, and while the emergency vehicles were en route, I set the brakes and started the after landing checklist. The checklist was going fine until it came to, JETTISON BRAKE CHUTE. GULP! It suddenly dawned on me that we had not deployed our brake chute. I was so busy keeping everything together that the chute was not deployed. My CP said, "Let's pull it now before they get out here and tell them it malfunctioned." I thought a minute and couldn't do it. All I could think about was the hours it would take for maintenance to find nothing wrong with the deploying mechanism.

The ground crew confirmed that we had blown two tires. That's all I needed to hear. I knew I was in line for a conference with the Wing Commander. Not to be disappointed, the Command Post issued an invitation I could not refuse to report to the Wing Commander ASAP.

I reported to the Wing Commander in a military manner. He stared at me for the longest time and then asked me why I hadn't used the brake chute. I didn't have an answer. I couldn't tell him that I forgot. So I told him I made a decision not to use it. That's when the sparks began to fly. I'm lucky to have gotten out of there with all my skin still attached to my hide. I walked out of that office more humble and a little wiser.

Reflex Rotation

I was involved in many reflex operations throughout my duty at Lockbourne. In the U.S. I deployed to Pease AFB, and in England I deployed to Chelveston, Greenham Common, Fairford and Brize Norton. I remember very well one such deployment to Greenham Common that was one of the more interesting trips I made.

This was a typical single ship night mission. The take off time was adjusted as usual to compensate for the six hour time deferential which staged our approach for a mid-morning arrival. I had a relatively new CP assigned to the crew on that particular trip so we spent some time coordinating crew duties and responsibilities. Preflight, take off, level off and air refueling rendezvous were normal. Our refueling track took us northeast toward Newfoundland. This was a winter deployment with marginal weather conditions forecast over region. I approached the tanker and made contact. All systems were normal and fuel transfer was progressing according to plan. I maintained my position in the green when all of a sudden all heck broke loose. I had a wild control input, which gave me a real struggle. I fought desperately with serious rudder control to overcome a severe asymmetrical input, to stabilize the aircraft, and to avoid a disconnect. I called the CP to check engine instruments, engines and wings. He reported that everything was normal. I continued with the remainder of the fuel transfer wondering all the time what caused that wild ride. I finished refueling, disconnected, made my descent and settled into a normal configuration.

After checking the CP about the fuel load and the fuel curve, I made a quick check of my instruments and was startled to see number one engine gas temperature (EGT) gage pegged with low revolutions per minute (RPM). I made a quick visual check and saw white-hot exhaust streaming from number one engine. I quickly closed the throttle and pulled the fire button. I had a few choice words to share with my CP wondering what the heck he was doing during air refueling, especially after I had experienced a wild control input and asked him to make a complete check. We had an engine stall on number one engine during the air refueling and I had no idea if the engine was damaged. I didn't know how long the

EGT was pegged so that was a concern. I mulled this over for a few minutes and realized we couldn't continue across the ocean with an engine shut down.

Just as I was about to start checking weather in the area I noticed the oil pressure on number two engine dropping. That's all I needed. Did number one engine throw a compressor blade into number two engine and cause the oil leak? I really had no way of telling especially when it was so dark. The air refueling wing lights weren't any help. So I shut down number two engine and had four engines left for my trip to an alternate. Nothing like having two engines out on the same side, especially an outboard. I checked the weather and the only alternate available was Goose Bay. Unfortunately the weather was beginning to deteriorate with heavy cross winds and snow. I still had a few hours of fuel to burn off and the tension in the cockpit could have been cut with a knife. The forecast called for heavy snow about the time we were due to penetrate and land. When I made my final weather check prior to let down the snow was coming down like crazy and I was sweating out the crosswinds and runway condition. The command post relayed the runway condition as poor with poor braking action. That's all I needed to hear. I penetrated, made an instrument approach, broke out about 200 feet, fought the crosswind and put the beauty on the deck.

On the landing roll the wind was blowing the chutes to one side and pulling the aircraft to the other. I had to jettison the approach chute on the runway and jettisoned the brake chute as soon as I had the landing secured and knew I could clear the runway safely. We parked that aircraft and walked away feeling pretty lucky considering the circumstances.

Aircraft Fuel Contamination

In the early days of the B-47, Lockbourne used JP-4 fuel additives to counteract water contamination. I don't remember the exact year, but it must have been around 1961. We had experienced a very cold winter and on top of the cold weather a serious malfunction of the petroleum delivery system occurred. For some reason or other the ground fuel system filters became compromised and JP-4 fuel was delivered without the proper additives. All of this was unknown by the ground fuel personnel and winter operations continued as usual. After the winter began to retreat, strange things began happening to our fleet of aircraft. Some of the B-47s started to experience in flight flameouts. The maintenance organization began checking systems in order to identify the problem. The real problem was not discovered until several other flameouts occurred. The events were serious enough to risk the loss of aircraft. Some of the aircraft ended with ice clogging their fuel filter system. The investigation turned up an unheard of situation. The inside walls of the

fuel tanks were coated with ice. The suspended water in the fuel came out of solution and froze on the inside of the fuel tanks. Because of the cold weather, the ice remained in the tanks until the temperature began to increase and the ice began to melt. At that point we began experiencing inoperative fuel gages and all kinds of problems.

The decision was made to deploy the aircraft to Hunter AFB, Georgia. The plan was to shoot approaches in the local pattern until minimum fuel (what ever that was to be) land, taxi in, park and then continue running engines until all the engines flamed out. At that point the tanks were purged, refueled and the aircraft redeployed to Lockbourne.

I had the distinct pleasure of deploying one of these ailing aircraft to Hunter AFB. I had some real reservations about the whole process. I didn't have a lot of confidence in the plan. That was born out by the malfunctions I experienced prior to a successful deployment. I completed all required checklists and taxied out to the approach end of the runway. As I was taxing out several of my fuel gages began to spin wildly and eventually failed. I had about three fuel gages inoperative and had no accurate way to measure how much fuel was on board the aircraft. I taxied back in, parked the aircraft and shut down. I had lots of staff cars around my aircraft and everyone wanted to know why I had aborted my take off.

I explained my actions and the maintenance troops drained a few sumps. What I saw blew me away. The Deputy Commander for Maintenance was holding up a glass quart jar filled with fuel. The fuel was separated into two distinct layers. The bottom quarter of the jar was filled with water with JP-4 floating on top. I was not happy! I felt a lot of pressure to take the aircraft, amidst guarantees that things would be better once I became airborne. I still wasn't convinced that flying that particular aircraft, with that particular problem was in my best interest. I huddled with the Deputy Commander for Maintenance and the Deputy Commander for Operations and the decision was made to drain all the sumps, let the aircraft set overnight and drain the sumps once again the next afternoon.

The sumps were drained and I was assured that things were fixed and I would have an uneventful flight. Yah right! After taxing into position at the approach end of the runway, my fuel gages went crazy again. I checked with the Command Post and informed them that I would be taxing in again. If they weren't happy with me the first time you can imagine the reception I received when I climbed down the ladder of the entrance hatch. Another check of the sumps revealed the same problem. My fuel was just too contaminated for me to safely accept that aircraft. So the decision was made to defuel and refuel the aircraft while we twiddled our thumbs. I'd rather twiddle my thumbs than have to bite my nails.

Once again my aircraft was ready and I finally got the bird airborne and en route to my destination base. I arrived over the fix and made my penetration and approach to the base. I continued making approaches until I had about 14,000 pounds of fuel remaining. I still wasn't confident of my actual fuel load so I decided to make a full stop and error on the safe side. I taxied in and maintenance parked us in an isolated position in order to complete our ground operation. We sat there in the chocks with engines running at a pretty high power setting wondering how long we would be sitting in the aircraft. It was late evening and we were tired. I released the Navigator and conditioned myself for a late evening. Time passed as we monitored the fuel flow when all of a sudden an outboard engine flamed out. It wasn't long after before other engines began to flame out. After the last engine flamed out our fuel remaining was 8,000 pounds. I was glad that I decided to call it quits in the pattern with 14,000 pounds remaining. In retrospect I only had about 6,000 pounds on board when I made my final landing. You can't get very far in a B-47 with only 6,000 pounds of fuel remaining.

That fuel contamination problem was an excellent lesson for the Wing and this budding aviator.

A Classic Lady

The B-47 treated me with dignity and kindness but still was not too forgiving of an aircraft. We all had to fly her within the boundaries and had to pay close attention to the task at hand. However, when handled with respect, care and attention, the B-47 turned into a classy aircraft.

I still love the beauty of her lines and feel a tug at my heart every time I see her. It was an exciting period of transition for SAC and the Air Force and I feel very proud to have been a part of her history.

No wonder the B-47 was selected to represent the chosen few aircraft of the century. She deserves the honor of gracing the beautiful sheet of U.S. Postal stamps called "Classic American Aircraft." She will always remain a gracious and sleek one-of-a kind beauty.

Could You Buy a Ride in a B-47 for $50?

By Captain Neil A. Ludvigson, USAF (Ret)

We have all heard the stories of the $600 toilet seat. Well, I'll bet you never heard of the $50.00 ride in a B-47.

All of us who had experience in the B-47 know the value of the excellent ground crews and crew chiefs we enjoyed and depended on in our operation of this aircraft. Let's face it; the B-47 was maintenance "hog." Back in the late 1950s and early 1960s, it was estimated that to get the wheels in the well of a B-47, it cost an average of $10,000 in materials and manpower between each flight. No figures were ever shown to us as pilots, but from practical experience, that sounds about right to me.

As valuable members of the ground crews, the crew chief was eligible for $50.00 per month flight pay if they flew the customary 4 hours a month required by regulations. That $50.00 flight pay was pretty important to those guys back then considering the very meager regular service pay they received.

On numerous occasions, our crew took these guys along on missions as a regular course of events. Their presence was always welcome. Many times it was a chance for them to catch a few hours of well-needed rest from their normal hectic schedules. As we all know, the "isle" of the B-47 was a great place to catch a few winks if you could get the right padding underneath you and the crew wasn't ragging you to heat soup in the soup cups or handing up the water bottles and box lunches.

It was very near the end of the month, and our crew had filled all of its "squares" for that quarter when our Operations Officer told us to schedule a 4 1/2 hour PP (Pilot Proficiency) mission because one of our Squadron crew chiefs had been sick and had not had a chance to pick up his four hours of required flight time in order to get his $50.00 of flight pay. It seemed pretty wasteful to us, but being good soldiers, we went ahead and did our mission planning for the next day's PP mission as ordered.

We talked about the World Series baseball game that was being played the next evening. We figured we would go up and tool around with the drag chute deployed, the drag gear down and twenty degrees of flaps down, and we would burn off plenty of fuel while we listened to the ball game.

If we timed it right, we could cruise between Kansas City, MO and St. Louis on autopilot and listen to the ball game. A real relaxed mission. We would burn off enough fuel in about three hours to get down to landing weight. We would then go back to Whiteman AFB, our home base, and shoot an hours worth of touch and goes before calling it a night. This should eat up our 4 1/2 hours.

In the meantime, our crew chief would get his flight pay. Everyone wins (except the taxpayers).

The crew met at personal equipment as usual and we were transported to the aircraft in a crew cab. The walk-around and pre-flight were routine and leisurely.

As usual, about twenty minutes before takeoff, we cranked the engines. The only thing that was wrong at this point was that our main reason for the flight had not as yet shown up. Where was our crew chief?

We had the tower put us through to Operations and they, of course, said, "Stand By." Everything was ready. We had our clearance, the engines were running and the only thing left was for the crew chief to show up, close the ladder door, tell the ground crew to pull the chocks and we were ready to taxi.

For those of you who were in SAC, you may remember that taking off on time was paramount. We were all graded on on-time take-offs. Three minutes deviation was all that was allowed.

Time tension was mounting. Still no crew chief. Operations was patched into us and advised us to continue to hold with engines running. We requested Operations to contact SAC Headquarters (Sky King) per regulations, and request that the mission be scrubbed. After all, our "squares" were filled for the month and our crew did not NEED this mission for proficiency requirements.

About five minutes before take-off time, we were advised by Operations that SAC would not authorize the scrubbing of the mission and we were told to go. Go we did.

We flew our plan. We blew out our fuel while listening to the ball game while flying a holding pattern between Kansas City and St. Louis. When the fuel was exhausted to landing weight, we did a couple of touch and goes and went to the barn.

We never did find out what happened to our crew chief and wondered if he caught another hop for his $50.00. Anyway, it sure cost the taxpayers a lot more if he did.

How far would $50.00 go toward buying a ride in a B-47? Better yet, could you buy a ride in a B-47 for $50.00?

Crew Chief

By Sgt. Robert Covington, USAF, (Ret)

As a kid, I had a fascination for airplanes and spent many hours after school and on weekends hanging out at the local airport to learn all I could. Because of that experience, I enlisted in the U. S. Air Force in December of 1952, at the age of twenty.

I went to tech school in Amarillo, Texas and upon leaving Texas, I went to the SAC base in Lake Charles, LA where I was to be a crew chief in the 68th Bom-

bardment Wing. Much to my surprise, I had to wait almost nine months before seeing my first B-47. I spent those nine months as an assistant crew chief working on B-29's. It was a good foundation for what was to come.

I can remember the day I finally saw my first B-47. I was awe-struck. She was a pretty lady, indeed. I spent the remainder of my enlisted years, until I was discharged in December of 1956, with a B-47 as my constant companion. Where she went, I went. The one thing that was so impressive with this particular plane was that even though she weighed approximately 193 tons fueled and loaded with cargo, she was as light as a feather to handle.

My primary responsibility as a crew chief for the B-47 was to always keep it in flying condition. Many long days spent, sometimes from 6:00 a.m. till midnight. There always seemed to be a problem somewhere on the plane that needed my attention and there were always engineering changes.

One of the most difficult tasks was to test the landing gear on the ground. I also had to master the starting and conditioning of the plane's six engines. All engines had to be operating on the same rpm at 100%. After stabilizing and adjusting high-speed stop, I would throttle burst and adjust flow dividers and trimmer valves. I took my responsibilities as crew chief very seriously and was very conscientious about keeping my plane in operating condition. I soon earned the nickname of "Dagger" because I was always digging around to find exactly the right tool to use. there were even times when you had to make it or you didn't have it.

You had to be especially careful in fueling the B-47 because of static electricity. There are several fuel cells on the B-47. If you have even a minor leak you can have a major problem. One rather frightening experience was watching a B-47 with one of its fuel cells leaking pass numerous other B-47's parked on the flight line. This could have been a dangerous situation. I jumped in the nearest vehicle to me and chased that plane down until I could communicate with the aircraft commander that he had a fuel problem. I think I possibly saved a disaster from taking place.

I can also remember having to paint the bottom of the plane with white paint, which acted as anti-radiation protection against the fall-out of bombs when they exploded. This was no ordinary paint job and it was quite a task to say the least.

By serving in the Air Force, I felt like I was doing something good for my country and I was proud of the work I did. During my four years of service I was able to obtain my high school diploma as well as an associates degree. I also served in two different APO (Over Seas Assignments) numbers. One of the highlights of being part of the 68th Bombardment Wing was the opportunity of meeting the Commanding General of SAC, Curtis LeMay.

A B-47 is now housed at Grissom Air Force Base in Bunker Hill, Indiana in their museum. I get to see her often as I live only sixty miles away in Goshen, Indiana. I guess you could say that the B-47 and I retired in Indiana.

Dead Men Flying

By Colonel Louis Wagner, USAF (Ret.)

After our crew was formed and we successfully completed our initial check rides, we were assigned a war plan target. In keeping with our status as a newly ready crew, we were given a low priority target: military complex in a satellite country. The complex was far from any large cities, and we would have a relatively easy run to the target and to a recovery base. Even so, I had long ago realized that if we ever took off on our war mission, we would be dead men flying. The odds of getting to this target and dropping the weapon were pretty reasonable, but the chance of ever returning home alive in the aftermath of a nuclear exchange was slim. I also realized that when I took off in a war I would be leaving my family in a killing zone for Russian missiles and airplanes. They targeted our air bases for primary strikes just as we targeted theirs. Even if I made it back to the States alive, those that I loved most would be gone. In a nuclear war, the airplanes on both sides would be flown by ghosts: men who were as good as dead or who would be without a livable life even if they survived. I had come to terms with this. It was the unspoken burden SAC crew members and their wives carried during the Cold War.

When our crew upgraded from "Ready" to "Lead Crew" status, we were assigned a new war target and a new bomb. The new target was a military field on the edge of the Soviet Capital. The new bomb was the biggest and dirtiest weapon in the inventory. The blast and heat from the bomb would kill hundreds of thousands of Russian civilians outright. Nuclear radiation would contaminate hundreds of square miles of territory for hundreds of years and cause even more deaths. The cold realization of that level of destruction forced me to re-evaluate my position. Was this morally justified? I already knew that I was sacrificing my own life and the lives of my wife and children if I ever flew a war mission. Could I add to that the deaths of perhaps a million people killed as a result of my actions? It was a daunting question. I had to answer it.

When I had entered flying training, I dreamed of being a fighter pilot. My fighting would be against other military pilots or soldiers on the ground. I knew that attacks from the air are imprecise, and often there are civilian as well as military casualties. That had always been a part of war. Now, by some quirk of fate, I

had ended up in B-47s in SAC. That meant being prepared to totally destroy the fabric of another country. I struggled with the issue of the new target and the new bomb for weeks. I couldn't talk with my wife about it. I didn't want to scare her. Somehow, I couldn't talk to the other crewmembers either. I didn't know if they ever thought about such things. The nearest we ever got to the subject was jokingly referring to ourselves as paid killers. At the time, I was not affiliated with any church. It seemed to me I was alone. This was the kind of question that could only be answered internally with each person working out his own answer. I believed in the concept of a moral defense. I knew that without strong military force our freedom was endangered. But to be responsible for that level of death and destruction, should I – could I – do that?

After weeks of indecision and struggle, I resolved the question through a paradox. The United States was not the only country that had nuclear weapons. The Russians had equally awesome power. Although they were not as good at delivering their weapons as we were, I was sure they would try if they ever got the idea that they could strike us and only suffer a low, acceptable level of damage to their own country in return. The only way to make the price of such an attack too costly was to maintain a force so strong and capable and determined to strike that the Russians would not pay the price. Our very willingness to make war and to destroy hundreds of millions of people was our protection and guarantee against a war ever starting. Years later, this became the basis of the MAD (Mutual Assured Destruction) strategy used by both the U.S. and USSR to maintain the peace. It was crazy concept, but it worked. I have always wondered if other crewmembers in SAC struggled with this issue as I did.

How Our B-47 Came Through In A Moment Of Need

By Lt. Colonel Frank Knaack, USAF (Ret)

Way back in the Middle Ages, when aircraft had crew names on them, my crew had a 320th Bomb Wing – March AFB B-47 assigned to them whose tail number was 318. "She" (pardon my political incorrectness) was a nice flying machine, made nice landings and offered my Bomb – Nav a very good CE average. There was one bad thing, as follows:

EACH takeoff was followed by an indication, GEAR NOT UP AND LOCKED. That little indiscretion was insistent during each takeoff, but would become positive as soon as the gear was recycled. Many times, maintenance would hate to see the write-up after the flight, because it meant putting the aircraft on jacks and

recycling the gear. ALWAYS- during the test, everything worked, lights dutifully flashed: Gear up and locked. It got so commonplace that other crews would return, anger in their voices and proclaim, "D... airplane got a 'not-up-and-locked' indication, AGAIN!"

Came the day of the 1957 competition called "Treasure Chest." Airplanes and crews were matched, and we would fly good old 318. An unsafe gear indication would mean a recycle, and cost us fuel, not to mention the raised eyebrows of bigwigs from SAC.

How shall we counteract this airplane's constant problem of a bad indication of gear? Our crew got together. We tried to second-guess the airplane's problem and to make it well. We offered a few prayers, tried a prayer rug, lighting candles, invoking the great Norse Gods to assist, hung a rabbits foot in the wheel well. My mother told me we should rub boiled goose grease on the bad parts as her great-grandparents in Switzerland used to do.

Came the day of the big flight. Down the runway we roared. Up came the landing gear handle. We dared not look at the panel ... then a shriek of joy, green light, gear up and locked, no need to recycle! We were so elated that we probably flew better, did good navigation to Alaska, and had a very close bomb run. The mid-air refueling went without a disconnect, paperwork was about perfect, and we landed within ten minutes of our prediction.

Later, at the gathering of the Wing, the Colonel stood up and announced, "The winner is crew # xx, a Standboard crew." Well it figures, they were the best. Then the Colonel said, rather quietly, "But we have a co-winner. Crew of Harris, Knaack and Bates. They were one-tenth of one point behind the Stand-board crew and the judges have decided to award both crews the championship. Besides, any crew that can get 318 to give a gear-up indication deserves the award."

Wow! Two crews won. Six silver goblets were passed out. Elation all over the place; 318 had finally gotten over her gear hang-up problem. Competition now over, we went back to the normal routine of training flights, alerts, sightseeing trips to Alaska and other exotic locales. A week later, airplane 318 was ready for her next flight. We climbed in, patted her on the wing, and took off. A few seconds later, on the instrument panel: GEAR NOT UP AND LOCKED!

For the next few months until I left to go to B-52 transition, I watched the maintenance reports, and on each flight, GEAR NOT UP INDICATION, HAD TO RECYCLE.

All I can say is: The old girl # 318 came through for us when we desperately needed it. May she rest in peace, and I hope it didn't hurt when they turned her into scrap metal. The silver cup still resides on my fireplace mantle.

A Few of My B-47 Stories

By Lt. Colonel Sidney F. Wattinger, USAF (Ret)

Strategic Air Command "The Movie"

There was a time in June 1954 when the flight crews and personnel of the 305th and 306th Bomb Wings were called upon to be part of a movie called "Strategic Air Command." We played bit parts in the briefing room scene, MITO takeoffs and the air refueling sequence.

I must say that I was glad that I was a pilot and not an actor. It took them nearly four hours to shoot the briefing room scene. The actors, many of whom were unfamiliar with Air Force lingo, made numerous errors in terminology and often forgot their lines. Thank God for Colonel Lassiter who was the Air Force technical advisor on the film. You may remember the scene where General Hawks (played by the actor Frank Lovejoy, i.e. General LeMay) landed and taxied down the runway in a C-47. As I recall, they shot that scene four times. The C-47 would taxi in and shut down the engines, then they would stop filming and someone would connect a tow bar to the plane, then they would back it up, and finally restart the engines and do it all over again. Yes, I would rather be a pilot on a "Globe Trotter" mission than an actor and have to put up with that.

On the day they filmed the MITO (minimum interval take-off) takeoffs, the people of Tampa became concerned and started calling the base, the newspaper, etc., wondering if we had gone to war. Usually we practiced our MITO takeoffs with two to four aircraft, not fifteen or twenty. (NOTE: I don't remember the exact number of aircraft involved.)

The air-refueling scene was shot from the waist gunner's position of a B-25 flown by Paul Mantz. He must have had the throttles to the firewall because we were hanging, and it was difficult to get on a good plane to complete the air refueling at our speed.

When they finished shooting, there was a party for all at the "O-club" in which the cast participated. I think that everyone who was there will agree that it was a memorable evening. The actors were just down to earth folks. At the time, my wife Betty was pregnant with our 2nd child. I remember that Frank Lovejoy made a comment to her about the Chinese broqueted jacket she was wearing and how pretty it was. He said his wife had one just like it and he wondered where she got it. Coincidentally, they were both purchased in the same shop in San Francisco. He really made her feel special.

"Operation Tryout"

In 1956, two crews from the 306th Bomb Wing and I believe two from the 305th Bomb Wing were sent TDY to the 2nd BW, Hunter AFB, Georgia for "Operation Tryout". This was an early test of what later become the alert concept for all strategic bombers (to be in a cocked configuration, i.e. weapons, fast start, and to be airborne in fifteen minutes). Fighters had been using this same concept in order to scramble in a minimum time. As well as I can remember, we were on alert three days and off one day. Those that were TDY stayed in an old hotel in Savannah while off alert. Each crew was TDY for six weeks. We practiced the *Alpha, Bravo, Coco* and *Romeo* alerts. About the only problems that I can recall was people not remembering the code for the day to access the alert area. Most of us just wrote it on their flight line pass. In general, things went fairly smooth. Although there were minor problems, I don't recall anything serious. Later on, each base had it's own Alert Facility and Overseas Alert which became "Reflex Action."

"Reflex Action"

By the mid-1950s, Reflex bases had been established around the world. The 305th and 306th BW's were both assigned Sidi Slimane, Morocco in 1957. Five crews from each wing were sent to this base for twenty-one days instead of the complete wing ninety day TDY's. When we arrived, we spent seven days on alert and this was followed by six days of R&R. Crews were allowed to travel to different locations throughout Europe or wherever they wanted to go. Transportation was supplied by Base Support aircraft, i.e. C-47 or whatever aircraft was available. When we returned, we spent seven more days on Alert, and then we redeployed to our home base. Our replacement crews came in the day before we redeployed. When we returned, we spent the next two to three months at home base with normal scheduling. There were times, due to crew availability, that you might receive another "Reflex" assignment as early as twenty-one days from the last assignment. Later, in April 1958, the 305th and 306th BW's were reassigned to Zaragosa, Spain.

"Life Magazine Report about SAC Alert Crews"

In late 1957 or early 1958, *Life* magazine wanted to do a story about SAC crews on Alert. Somehow, they received clearance and the Paris, France bureau sent three members (the head of the Paris office, a writer and a photographer) to Sidi Slimane, Morocco where they were assigned to my crew. They literally slept, ate and went on alert with us. In fact, they even followed us into the bathroom. The only thing they couldn't do was to attend morning briefing (due to classification) or get on the aircraft with us. Every time we moved, they took pictures – how many, I don't

know, but it must have been in the hundreds. They even went on R&R with us, where they wined and dined us. Although they weren't really a burden, none of us was used to having someone follow you around twenty-four hours a day. We had to be careful not to discuss anything classified in their presence.

It was almost a year before the article was finally published in the December 1958 issue. I'm sure that SAC did a lot of editing because there was very little about the alert or the alert crews. The opening picture, as I remember it, was the crew Christmas shopping at the BX. We were looking at model trains. In summary, I think they wasted a lot of time and money.

Quothe the Raven: "Nevermore"

By Lt. Colonel Robert B. Wiley, USAF (Ret.)

With few exceptions nobody remembers the blocking backs for the outstanding running backs in the NFL. Maybe Jimmy Kickk for Larry Czonka but who blocked for Jim Brown, Tony Dorsett, or Gale Sayers? The same may be said about the crews of the 301st Bomb Wing (Medium) and their Phase V aircraft. Are you lost? Let me explain.

In mid-1958 the 26th Strategic Recon Wing at Lockbourne AFB, Columbus, Ohio, was redesignated the 301st Bomb Wing and the mission was changed from reconnaissance to Electronic Counter Measures. Our RB-47Es were replaced with B-47Es that had undergone a modification called "Phase V". This change resulted in removing normal bombing equipment and fittings in the bomb bay and replacing them with a self contained "pod." Inside the pod were two seats for ECM operators and banks of scanning and jamming equipment. Our mission, much like that of a NFL blocking back, was to protect our fellow crews carrying weapons of destruction. We were to join the bomber stream to seek out and jam enemy radar, which controlled ground fire and fighter aircraft.

Nothing can diminish the role of the bomber crews and their tremendous impact during the Cold War. Any praise or recognition that they may receive is little enough for the outstanding service they performed. I would, however, like to share some of the things about their "blocking backs," the Phase V crews.

As you may have noticed, we carried five crewmembers rather than the normal three on a B-47. Of course there was the Aircraft Commander, copilot, and the bombardier/navigator. On my crew, L44V, we had an ECM officer who had been a navigation school instructor and an NCO who had flown "The Hump" in the CBI during World War II. They were an outstanding pair! Men in their specialty were

called "Ravens", supposedly from the Edgar Allen Poe "nevermore" concept applied to "no successful enemy radar."

Takeoff for our crew was not unlike bomber crews except that the two "Ravens" were seated in the walkway between the pilots and the entry hatch. At 3,500-feet, the aircraft leveled off and the ECM troops crawled back and entered their pod workstation. When they were sealed in and pressurizing, they notified the Aircraft Commander and the climb was continued. During the entire mission, they were seated backwards, facing their consoles. Had there been an emergency, they, like the Navigator, would have ejected downward. No daylight, very little room to move about, and a seven-hour mission must have been like purgatory. Especially during a rough refueling (I'll admit it) when my Sergeant responded to my apology with "Don't worry, Sir. The last time I had a ride like that I had to pay a quarter at the county fair." After penetration from altitude, the bird was leveled at 3,500-feet and the Ravens resumed their positions in the walkway.

Each bomb plot had the capability to evaluate the work of the Ravens and reports were forwarded to Squadron and Wing. My guys were consistently among the top crews. Thankfully, we never had to launch in anger but I am confident that our bomber buddies would have been given as much protection as the equipment could furnish.

Have you gathered that I am very proud of my crew? Mel Wilson, copilot, had played ball for Ol' Miss, was outstanding on the sextant and guns, and re-fueled well from the back seat. Dave Nicholson, Navigator had left a Select Crew to work for civilian aviation, got bored, and asked to be recalled. Ed Icenogle not only excelled as an ECM man but would plot celestial fixes with Nick when Mel called down his sextant reading. (They flew celestial like a PNL!!) NCO Harold "Moon" Mueller, on more than on occasion, straightened out a radio problem when ground crew technicians were stumped.

Here's to L44V, one of SAC's top "blocking backs!!"

The B-47E Phase V

By Captain Ronald Camp, USAF (Ret)

Before I begin this introspective journey back to my "flight" of youthful fancy, let's jump back to February 24, 1994.

I was attending one of the wonderful monthly General Electric Aviation Lectures held at the Smithsonian Air and Space Museum in Washington, D.C. A former B-47 test pilot, project engineer and program manager named Robert M. Robbins was the speaker at a seminar on the development of the B-47.

I watched nostalgicly as his visuals showed the first B-47 prototype lift off from Boeing's Seattle, Washington plant in 1947 with Robbins in the seat.

Later in the question and answer session that follows each lecture, I prefaced a question to him by commenting that I had been an Electronic Countermeasure Officer on a five-man SAC B-47 crew. He didn't interrupt me but he did spontaneously throw his hands to his forehead as if to say "Oh my, what an unenviable job you had". From his "body-english" it was obvious that he understood the unpleasant aspects of that job – a job that I've been asked to tell about.

A brief description of the airplane, the unique-Phase V ECM equipment and the mission will be helpful for those not familiar with them. The B-47 was designed to be a bomber. As the Cold War intensified and enemy defenses became more sophisticated, our Air Force found that the B-47 had so many latent capabilities that it could be modified to do things that were never intended. Often those modifications, while providing new capabilities, did result in some unpleasant side effects.

The B-47 Phase V ECM configuration had some of those aspects that were recognized as unpleasant and potentially dangerous. However, in view of the Cold War situation, the "powers that be" accepted those shortcomings.

The B-47E Phase V ECM mission was to provide ECM protection for B-47 bombers by accompanying the bombers, detecting and locating enemy surface radar stations and jamming them so as to degrade or destroy their ability to see and track the B-47s.

The heart of the Phase V ECM capability was a separate capsule/pod that could be installed into the B-47 forward bomb bay on base in ten to twelve hours. Body fuel tanks were above it. The capsule was filled with ECM equipment operated by two ECM types (one officer and one airman) known as Ravens who sat in downward ejection seats. Like the main cockpit it was pressurized at altitude. To get sufficient height, the capsule projected some 8 inches below the lower fuselage contour. There were no windows and without the electric lights it would be totally dark. For safety reasons the capsule was not occupied during takeoffs or landings.

During takeoffs and landings the Ravens sat in the main cabin in crash harnesses on the passageway floor below and to the left of the pilots. The only ways out of the capsule were the two ejection seats (useless on the ground) and one small door that opened into a small tunnel on the left lower side of the fuselage.

The tunnel was about fifteen feet long and led forward through another small door to the main entry door on the outside of the airplane. Above the outside door was the pressure door to the cockpit. The tunnel was so small that one had to crawl through it on hands and knees and he could not even turn around in it. Because of the difficulty, the Ravens gave up trying to negotiate the tunnel with a parachute and instead each kept a chute in the capsule and another in the main cabin.

In flight passage between the forward end of the tunnel and the main cabin was severely hampered by the collapsed telescoping entry ladder, which was stowed between the two doors. To pass between the tunnel and the cockpit through the cabin pressure door, it was necessary to carefully put some of one's weight on the stowed ladder and hope the ladder would not accidentally jettison or extend through the main entry door and dump the Raven outside the airplane without a parachute!

Since the tunnel could not be pressurized, passage through the tunnel was done at relatively low altitudes with the airplane unpressurized. That meant that the two Ravens were confined to the windowless capsule for most of the long missions with only the interphone to provide contact with the cockpit – and that contact could be pretty sparse in a difficult situation where the three crew members up front could be too busy to communicate with the Ravens to tell them what was going on.

Many considered the Ravens' job to be most unenviable – at best it was no place for a person who was claustrophobic or lacked agility!

The Air Force, the B-47E, and me.

Now let me take you through my own brief sojourn with the B-47.

After graduating from the University of Maryland's AFROTC program in 1955, I was commissioned a 2nd Lieutenant in the United States Air Force.

In March 1956, I was sent to Ellington, AFB, Texas to attend Observer Training (Navigator) School (Class 57-03C-B).

In March of 1957, I choose to attend the NAV Electronic Countermeasures Course (Class 13037) at Keesler, AFB, Mississippi. I graduated in October 1957.

In October 1957, I was assigned to the Strategic Air Command's (SAC) 8th Air Force, 2nd Bomb Wing, at Hunter AFB, in Savannah, Georgia. Oddly enough, the squadron had not received a new ECM recruit in some time, so (it appeared) they really didn't know what to do with me.

This perceived lack of need ended in November 1957 when I was sent to the Wing's 20th Bomber Squadron. It seems an active ECM type was *leaving* – so there was a rush to get me "checked out."

Frankly, I had never flown in a jet, let alone a B-47. My first training flight left me very tired, sick with a headache, and a lot of questions. Upon returning from my first flight at 7:00 pm, the operations officer came in and asked for Lt. Camp. I answered, Yes, sir! He told me to report at 6:00 am the next day for my second flight.

I respectfully protested this assignment since I felt I needed more review, and because I had operations and flying safety questions that were unanswered. This became a moot point when my phone rang at 4:00 am the day of the second flight – it had been canceled.

Whether coincidence or not, my duties thereafter consisted of Wing Control Room Duty Officer (on Christmas Eve!), Officer in Charge of the Annual Commissary Inventory, and First Class Winter Survival Training (in 1958) at Stead AFB, Nevada (snow and all).

I did finally get that second flight and many more.

Preflight Procedures

Here is an example of a routine day preparing to fly the B-47E with the Phase V pod installation.

Each Monday morning, a briefing is held to review the week's flying schedule. The day before flying, the crew meets to decide the flight course and to plan the mission. The mission purpose allowed my enlisted counterpart (Raven Two) and me (Raven One) to practice receiving and jamming different types of ground radar.

Each week we plotted different courses in order to "jam" as many ground radars, as five hours would permit. Naturally, our goal was to get as many perfect scores as possible. This information was fed back to us immediately upon completing the jamming run.

After each planning session, we (the Ravens) boarded our plane to perform preflight procedures. We also checked antennas, wave-guides, and basically ensured the proper functioning of everything in our tiny capsule – especially receivers, jammers, and "parachutes." Moreover, this preflight review allows the maintenance crews time to correct any problems with the aircraft.

On the day of flight, we once again check the antennas, receivers, jammers and "chutes." During take off and landings, we were both positioned in the first and second crash landing harnesses up front in the main cabin passageway. In a crash, it would be even more dangerous to be in the Phase V bomb bay pod.

Normally, as the bomber climbs through 3,000 feet, the main cabin pressure (if on!) is dumped. Since I was in the first position, I was responsible for releasing the sliding interior cabin door lever, *very gingerly* stepping onto the collapsed (plane entrance) ladder, opening the bomb bay tunnel door, and climbing into the tunnel. Raven Two followed, closing the cabin door behind him. During this adventure, our knees generally took a beating from the exposed tunnel ribs.

We now prepared to enter the capsule. I unlatched the door and entered the enclosure, eyeballed the scene, climbed into my ejection seat (rear-facing) on the left side, and locked the mechanism. Raven Two followed behind me to the right seat.

Let me explain the "capsule." We flew in a nearly self-contained "pod" fitted into the bomb bay. It was made of a material resembling plexiglas that contained

no outside windows or exterior light. The entire assembly protruded about eight inches below the normal skin surface of the fuselage – that is why we were upfront during take offs and landings.

It was during midair refueling with the much slower KC-97 tankers that your vulnerability in the pod was the most frightening. The KC-97 was flying at its maximum speed while we were barely above stalling. What an odd sensation of helplessness you experience while in this captive sphere – the shaking, rocking, and stuttering conjured up images of possibly stalling and, worse, ejecting from the aircraft!

Incidentally, we had two-stage, downward rocket ejection seats that were activated by pulling the D-ring up from between your legs (with elbows tucked in tightly). Once the D-ring was pulled, cutter knives opened a square hole under the fuselage and the seat was jettisoned down and away from the aircraft.

We were now ready to go operational – power, intercom, lights, emergency red lights, pressure, temperature, and our mission equipment all in place. We also made sure the ejection seat safety pins were removed. Finally, by interphone, we checked our flight gauges with those of the main cabin.

Target Jamming

It was critical to know timing to radar IP target jamming in order for you to lock on to the target. Once the target run was completed, our scores were radioed back to us. If everything worked right, we usually scored a "9" on a 0 to 9 scale.

During our descent, at about 15,000 feet, we would get permission to come forward. This meant a physically brutal tunnel-ribbing trip in the reverse order mentioned earlier. It was made all the more hazardous since the tunnel was too tight to take our parachutes and it was not pressurized (no oxygen).

Here is the scary part. If the cabin pressure does not completely dump, the main cabin door won't open. At this point, without communication to the main cabin, you have to desperately work the door lever while carefully standing on the ladder. Hopefully, someone in the main cabin above was ready to open the door from inside.

On my final check out flight with exam instructor (Standboard), this *worst-case* scenario actually occurred. The aircraft was descending, the main cabin door would not open, and it was too noisy to try to talk. I "kicked" the instructor back into the tunnel in order to call for help using the capsule interphone. Complicating matters, the tunnel was not large enough for a man to turn around – so the instructor had to return to the capsule backwards and at an incline.

Upon landing I was told that I had "checked out," and I was assigned to a regular ready crew.

B-47 "Happenings" at Hunter

While at Hunter, we had an exercise to Lakenheath, England and back. Earlier, we were shown movies of the take off problems encountered by B-47s. Those films showing a large crest down the runway didn't seem to register with our pilot who, unfortunately, took off from Lakenheath (to home) with too little take off speed. The copilot over rode him. The gravity (G) meter read 4 as the plane bounced along and just barely rose over the fence at the end of the runway.

On our arrival, we were landing at Hunter at night – with lights and foam trucks paralleling the length of the runway. The pilot in the plane behind us said our landing gear "looked okay," but despite the gears coming down and the "green" lock light on, the copilot got up and performed a few revolutions on the manual gear extension cranks. The next day our plane was in a hangar undergoing retraction testing.

A year later at Brize-Norton in England, I learned from my navigator at Hunter that the pilot had to go to Omaha (SAC Headquarters) to "review pictures" of the takeoff and landing with all the emergency equipment lining the runway – not exactly a vote of confidence.

Also during my short stay at Hunter, a bomber dropped an "unarmed" atomic bomb in South Carolina, and a fighter conducting an ECM training exercise, against a B-47 rammed the tail and right wing of a B-47 and seriously damaged its right wing. The fighter pilot bailed out successfully. The next day I saw the damaged B-47 on the apron – the B-47 was a very forgiving plane.

In the spring of 1958, I was transferred to Lockbourne AFB, in Columbus, Ohio.

Flying out of Lockbourne, we wore long underwear and sweats under our thin temperate flying suites. We flew "cool" in case of a cold area bailout.

An incident at Lockbourne really bothered me when the operations officer didn't seem concerned when I complained about the condition of an aircraft selected for a preflight check. With the power on, my enlisted counterpart turned on an ECM jammer. I saw arcing (meaning no wave guide between the transmitter and antenna) and I ran over and pulled the power cord. ECM planes were to be preflighted the day before and all discrepancies reported in writing! Let's face it, this was SAC!

On our way to England (14 October 58 A/C 53-1865), after completing a jam run on ground radar FPS6 (Egg Nog) in Schenectady, New York (and just before midair refueling), we encountered sudden capsule decompression at 33,000 feet. We instantaneously attached our oxygen masks and went on 100% oxygen – we hated to fly eight (plus) hours wearing rubber masks. There was no smoke or other signs of trouble in the pod so I notified the pilot accordingly.

We experienced symptoms similar to the bends – body and joint aches and bloodshot eyes. During the midair refueling at lower altitude, we left the capsule and climbed into the main cabin for the remaining flight to England. I was told later that a pressure valve popped, and two other aircraft in our formation had the same problem and landed at Plattsburg AFB, New York due to the unconsciousness of some crewmembers in the capsule.

While we were at Brize-Norton, we had one practice alert a day. During one 3:00 am alert, the siren went off, but my navigator sleepily said it was only a "factory whistle." Then I heard the sound of feet tramping down the hall. I usually drove the jeep to the plane, but when my navigator and I got outside the building, there was only one jeep – with our pilot sitting in the driver's seat.

In the fog of the English night, we crossed the green-lighted active runway. The pilot drove to the next to the last plane on the apron – one that didn't have a jeep, which was a sure, sign it needed a crew.

When I reminded the pilot that the *last* plane on the apron was our plane, we drove to the last plane and arrived in time to see a crew exiting the aircraft. It seems that crew's navigator didn't recognize the checklist as his – a pinup girl inserted on every other page. So, we climbed aboard. Since everything was warmed up, we were the first to report "ready to go."

In closing, I want to say one thing: the B-47 was a great airplane.

Test flight in B-47E #53-2280

By CMSgt. Ernest L. Suggs, USAF (Ret.)

Background: From March 1958 until June 1966 I was assigned to the Wright Air Development Division, Air Research and Development Command at Wright-Patterson AFB. My specific assignment was to the Flight Test Operations, Bomber Branch, Bomber Aircrew Section.

Bomber Operations had six to eight B-47s, several B-50s, one B-52, one B-29, several B-57s and one B-66. During the early 1960s we got rid of the B-50s and received several KC-135s. We also had one B-26 with the wings sawed off and painted yellow that we used to test brake and drag chute systems. As the reader will note, we had a little bit of everything. The aircraft were used to test just about anything that had to do with aircraft (and space) and most were extensively modified to accommodate whatever it was that was being tested. Maintenance of the aircraft was the responsibility of civil service civilian Crew Chiefs and civil service maintenance personnel.

Bomber Aircrew Section consisted of about thirty military enlisted Flight Engineers, Flight Mechanics, Boom Operators and Radio Operators to provide the aircrews for the aircraft. Our Test Pilots and Navigators were assigned to Bomber Operations. The only times we were required to provide maintenance duty was when we operated away from Wright-Patterson.

I re-enlisted in 1958 after a four-year SAC assignment and an eleven-month break in service, specifically for a job with Bomber Aircrew. It was a job made in heaven. It was pure pleasure just to go to work. Over my eight-year assignment, I checked out for aircrew duties in the B-47, B-29, B-50, B-52 and KC-135. My titles varied with the different aircraft and test duties. I initially got the assignment because of my B-47 background.

The Story: In March of 1961 our Bomber Operations was tasked to provide an EB-47 for project "Arctic Terrain Research." Evidently we had sufficient tanker support to get the B-47s to their targets but not to get them home. The purpose of the arctic research was to determine if an ice runway, cleared on the Thule Greenland ice cap could support B-47 landing and taxi-takeoff operations.

The scuttlebutt information we initially received was that Flight Test Operations had tried to beg off the test because it was felt that the test was rather risky and that an accident would impact on our flying safety record which was not the best. The word that came back from HQ USAF was that the test results were vital for SAC and in the event the aircraft was lost the test would be considered basic research and not be counted against our flying safety record.

The test pilots picked for the mission were Major Shelton J. Anthony, AC and Capt. Joseph A. Guthrie, Copilot. The Navigator was Major Neil W. McCulley. I, TSgt Ernest L. Suggs was selected as Chief Engineer/Crew Chief, and SSgt William F. Handshy was Second Engineer.

On March 21, 1961 we took off from Wright-Patterson AFB for Goosebay, N.F. Canada. As many of you will recall four in the cockpit was cozy and five was downright crowded. The flight to Goosebay was normal. During the let down we experienced a problem with the left outrigger. In spite of several recycle attempts it refused to lock into place. Sitting beside the copilot, it became my job to operate the Emergency Landing Gear Extension handle. I cranked and cranked to no avail. Finally, we had no choice but to land. As we were on final approach, I gave one last heave on the ELGE handle and the gear locked into place. In so doing I slid down the step beside the copilot and lost about an acre of skin off my left shinbone.

Our Goosebay experience was not over. SAC had a REFLEX operation in progress and we were physically stopped on the taxiway by a Security Police vehicle. The aircraft commander reached into his pocket and handed me a set of

orders with the statement "Show these SAC weenies our orders so they will know we ware not the Russians trying to take over the base." I dropped the ladder with some difficulty and gave the orders to the Security Police. They studied the orders and immediately gave the order to shut down the engines. The aircraft commander had given me a set of orders for a JKC-135 going somewhere else. The whole crew was taken in to get the matter settled. While we were gone the aircraft was towed to the parking area. Maintenance support from the SAC troops was great. They greased the outrigger mechanism and refueled the aircraft.

The next morning we loaded up and headed for Thule AB, Greenland. I was surprised to learn that our alternate landing site, if Thule was socked in, was back to Goosebay. The flight to Thule was uneventful and the newly installed doppler radar put us right down the centerline of the runway. I don't' remember how cold it was, but it was very, very cold. We refueled the aircraft and made ready for the next day's flight to the ice cap. Over the next few days we worked many long hours in sub-zero weather to accomplish what we had come to do.

The first flight to the ice cap was made with just the pilots on board. Sgt. Handshy and I made the trip by truck. Landing, braking and taxi operations seemed normal. There was no ground support on the ice cap so all the engines were left running. As I recall, the ice runway technicians stated that the ice was about thirty-six inches deep. Takeoff and landing back at Thule was normal.

On the morning of the second day we found that the forward main gear strut was flat and a great deal of hydraulic fluid had leaked. I guess the extreme cold weather had taken a toll on the strut "O" ring seal. I can just imagine what the wind chill factor must have been on the exposed struts. We got an air compressor and bounced the strut several times. We refilled the fluid and the "O" ring held. The flight was made to and from the ice cap with no other problems.

On the morning of the third day, the forward main gear strut was again flat with great loss of fluid. The rear main gear strut and one outrigger strut was also leaking. A more serious problem, the left flaperon was stuck in a partially spilled position when the flaps were fully extended. It did operate normally with the flaps full up. We again bounced the struts, refilled the fluid and got the aircraft ready to go.

At this point I have to tell you something about Major Shelton J. Anthony. He was the most skillful B-47 pilot I have ever seen. He was also one cool test pilot. Knowing the importance of the mission and despite the mechanical problems, he again made the flight to the ice cap. This trip was different in that a TV crew was there to tape the operation. The TV crew asked to interview the pilots and with me left alone in the front seat, they walked some distance from the aircraft to avoid the engine noise for the interview. As the pilots were being interviewed by the TV

crew, one of the runway technicians came running up the ladder yelling that the ice was cracking around the aft gear. With the technician on the ladder I grabbed a hand full of throttles, gave them a hearty push and the B-47 shot ahead. I immediately figured I had applied too much power and pulled the throttles back and hit the brakes. The aircraft slid to a stop. I looked out the canopy and saw the pilots' running back to the aircraft.

The flight back to Thule was normal and the test mission complete. The aircraft was taxied to the refueling pit and was refueled. It was then towed to the parking area. As some of you will remember, the entrance ladder had to be pushed partially up to clear the tow bar. Well, during the trip to the parking area, probably due to the extreme cold, the ladder slipped down and was ripped off the aircraft by the tow bar when the tug made a turn.

Our landings and takeoffs on the ice cap had been very successful. SAC had the information they needed. I'm sure they were thinking about more ice runways than just Thule. The aircraft had many problems including a new problem with one of the throttles. It was sticking badly and required a lot of pressure to get to 100%. By the book we had at least five red cross items that would normally ground the aircraft. We had virtually no maintenance support other than ourselves. Major Anthony's decision was that "do whatever you can to fix the aircraft and we flew the damn thing in and we will fly it out." We bounced and serviced the landing gear struts, worked on the throttle and flaperon with very little success and preflighted for the trip to Goosebay.

The flight to Goosebay was normal. As if by magic the warmer air seemed to solve most of our problems. We got the aircraft ready for the flight back to Wright-Patterson and what a surprise. The landing gear strut no longer leaked, the flaperon operated normally, the throttle no longer stuck.

The flight home was normal with no other problems. I was kind of embarrassed when I had to tell the regular Crew Chief what had happened to the ladder. The B-47 was a tough old bird that in emergencies would fly with a lot of problems.

This aircraft has been completely restored and is displayed inside the hanger at the Air Force Museum. Visiting the museum and the aircraft is like visiting an old and dear friend. If you are ever there, stop by, admire the airplane and remember this story.

Footnote: The leaking (and sometimes flat struts) were serviced by first applying heat, adding fluid, then bouncing the struts using an air compressor and sometimes towing the aircraft in circles or figure eights.

The City of Salina

By Lt. Colonel Paul R. Houser, USAF (Ret)

It all began in the summer of 1954. An official document signed by Boeing vice-president J.E. Schaefer and his staff began the production of aircraft serial number 52609, a B-47E strategic bomber. This aircraft was the 1000th B-47 built at the Wichita, Kansas Boeing Plant No.2. Right behind the 1000th B-47 bomber was an RB-47, which rolled off the assembly line the same day and was stationed at Forbes AFB, Topeka, Kansas.

A special plant program also designated a drive in support of funds to be raised for the fight against polio. As each department assembled their portion of the B-47, money was donated and stuck to the aircraft frame as it went through the assembly line. Over $12,000 was stuck to the exterior of the aircraft when it was rolled out of final assembly on October 14th, 1954.

The aircraft was transferred to the 40th Bomb Wing (BW) where Robert M. Robbins, Boeing Senior Project Engineer and former Chief XB-47 test pilot witnessed the acceptance by Major General Walter C. Sweeney, 15th Air Force Commander; Brigadier General J.R. Sutherland, 802nd Air Division Commander; and Colonel Burton H. Burns, Commander of the 40th Bomb Wing, Smokey Hill AFB, Salina, Kansas. In addition to Brig. Gen. Sutherland, the crew who had the honor of delivering the bird to Smokey Hill AFB were 40th BW instructor pilot Major David G. O'Sullivan; 40th BW radar observer Major Roy L. Callaway and Colonel Burton H. Burns. The aircraft was delivered on the 17th of December 1954.

It was a crisp, cold day in Kansas, and the wind chill was very near the freezing point. This was Friday, 17th of December 1954; also the 51st anniversary of powered flight. Seven years to the day after Bob Robbins took the first experimental Stratojet into the air on its maiden flight, Brig. Gen. J.R. Sutherland flew the 1000th Stratojet to Smokey Hill Air Force Base. There, it was christened the "City of Salina." Present at the christening were Brig. Gen. J.R. Sutherland; Capt. Paul R. Houser, Aircraft Commander 45th Bomb Squadron; Donna Lindsey, Miss Kansas; Major General Walter Sweeney and Colonel Burton Burns.

On the same day at Forbes Air Force Base, another Stratojet, an RB-47E photo-reconnaissance ship (which followed No. 1,000 out of the factory door), was christened the "City of Topeka."

Donna Lindsey splashed champagne on the "One Grand" B-47 at Smokey Hill AFB, while Mrs. George Schnellbacher splashed Kansas River water on its sister ship at Forbes AFB.

Along with the 1000th Wichita built B-47 went a special aluminum plaque commemorating the celebrated occasion on which it emerged from the factory on October 14, 1954.

"The spirit of the building of No. 1000 will ride with the finest pilots in the world – that of the 45th," the plaque read in part. The "City of Topeka" Stratojet was flown from Wichita to Forbes AFB by Brigadier General David Wade, 21st Air Division Commander. Accompanying him were Major William Duda, observer and Capt. B. S. Barrett, copilot.

Aircraft Commander of the now famous No. 1000 was Capt. Paul R. Houser of the 45th Bomb Squadron. Both Captain Houser and his wife were former Boeing employees.

The 40th Bomb Wing was deployed to Lakenheath RAF Station, United Kingdom in June 1955. During this deployment, four special missions were of interest. First was a flight with Group Captain Clayton, British Bomber Command, assigned to Huntington RAF Station. The crew on this mission was Capt. Grant Johnson, radar bombardier; Lt. Dick Koepky, copilot and Capt. Paul Houser. The mission included navigation, air refueling and RBS-bomb runs on London, UK.

Second was an unusual but very interesting flight to Norway. The crew made low approaches to Oslo Air Station and landed at Tronheim Air Base for an overnight stay. This was scheduled to acquaint the crew with the facilities in Norway.

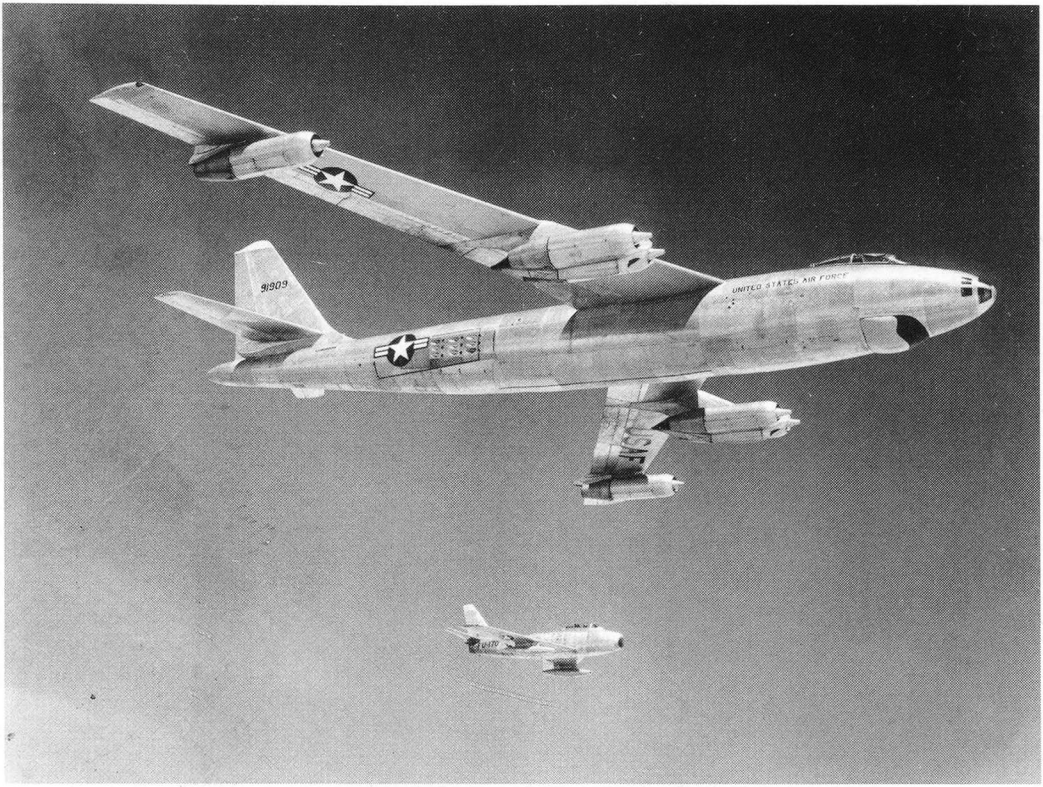
The third mission was more exciting and took the crew to Saudi Arabia. The crew flew from Lakenheath RAF Station to Adana, Turkey. Upon descent to Adana after flying down the Suez Canal Area, the front windshield cracked. It was determined that the crew would take-off the next day, fly at 20,000 feet to Saudi Arabia to lessen the pressure differential on the cracked windshield. The aircraft was part of a bomber stream but at lower level. All the way down the corridor between Turkey, Saudi Arabia and the USSR, they were continually locked on by radar and MiG fighters. Upon landing, the aircraft was taxied into a nose dock where maintenance personnel were waiting with sledgehammers to knock out the windshield as soon as the aircraft was stopped. The next morning, after the windshield was replaced, the "1000th" departed for the United Kingdom again flying at 20,000 feet. The mission through Tripoli and Spain was uneventful.

Later, but during the same TDY period to the UK, the runway at Zaragosa, Spain became active. Due to the rather large low spot in the middle of the runway, it was determined that different weight take-offs were required to determine the best weight for safe operation. The "1,000th" was deployed for 10 days to conduct these tests. Capt. Houser and crew conducted five different weight take-off condition tests and returned to the UK.

The wing returned to Smokey Hill AFB in September. Then the 1,000th B-47 was sent to Lockheed Aircraft, Marietta, GA for work. It was dropped from the inventory in October 1967.

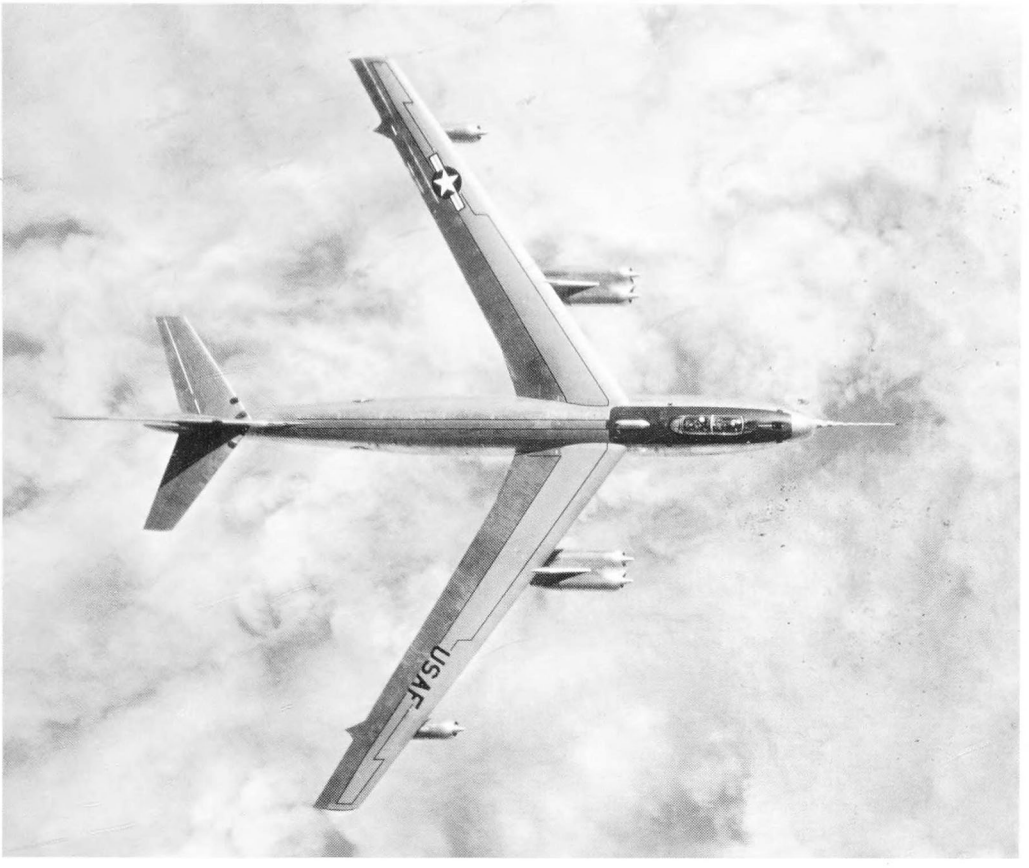
XB-47 #1 (6065) being towed to the runway at Boeing Field, Seattle, September 12, 1947.

A B-47B in formation with a biplane flown by Billy Parker.



The final "A" Model B-47 (s/n 91909) in formation with an F-86.

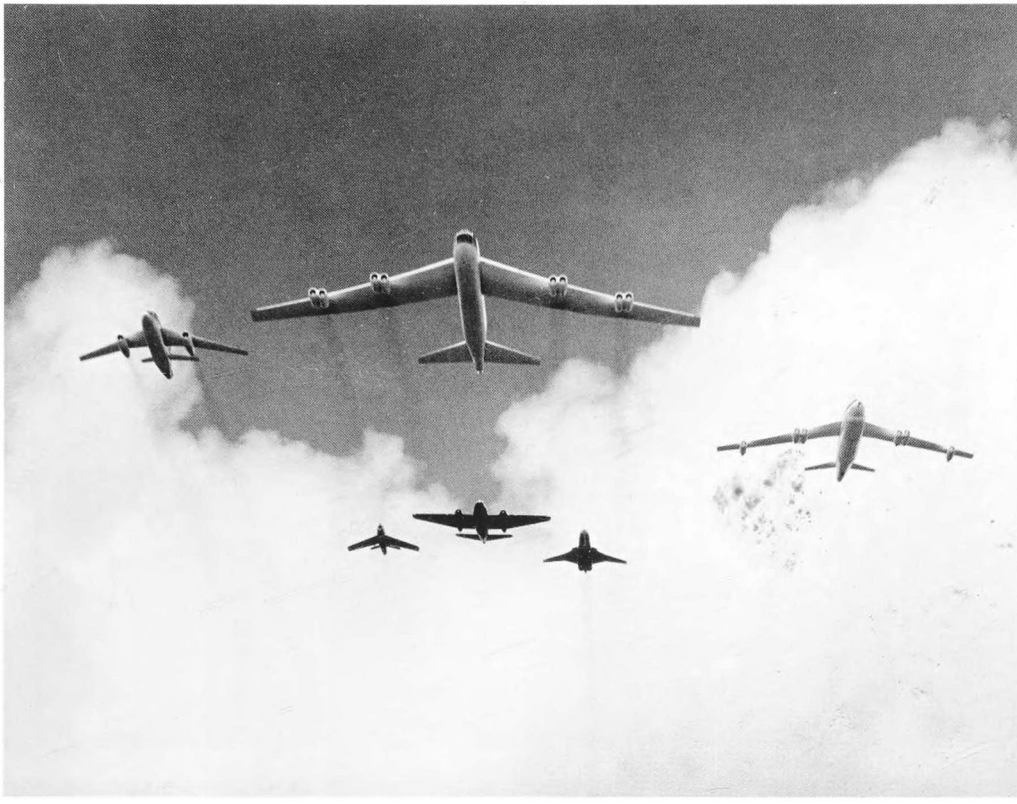
The first flight of the XB-47D took place on 8/26/55 with pilots Ray McPherson and Lew Wallick. Note the landing gear stuck in the down position.



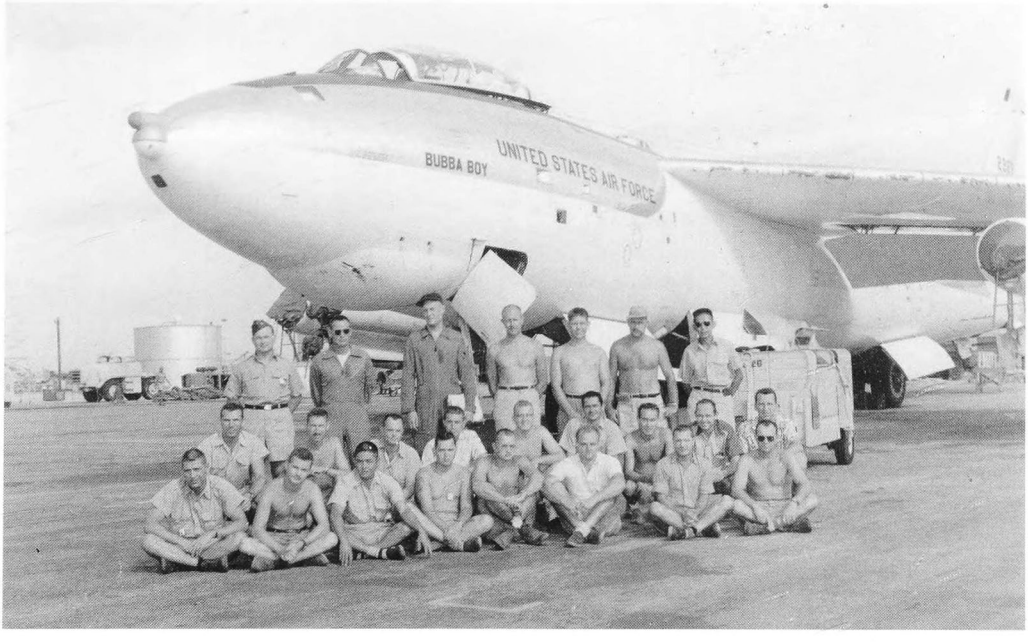
Overhead shot of a structural test aircraft at Wichita, 1953. Note instrument probe on nose.

The XB-47 (s/n 6065) landing with deceleration chute.

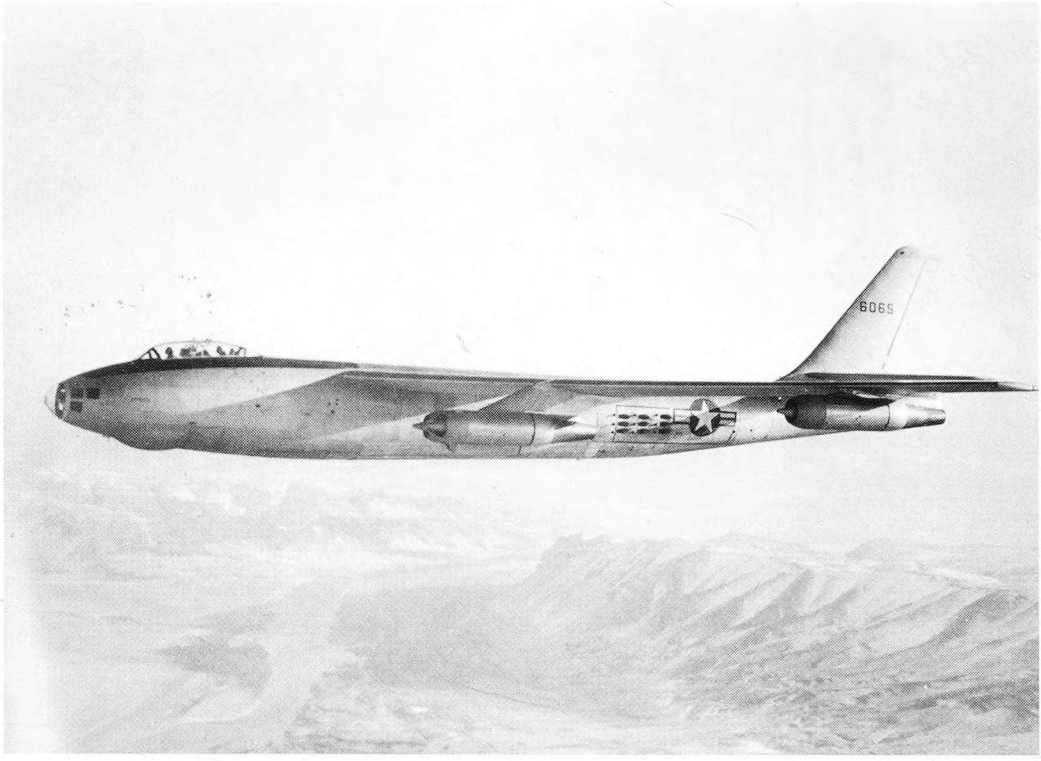
Boeing test pilots Curtis McNay, Ray McPherson, and Ed Hensley.



Formation flight of some weapons effects test airplanes from "Operation Redwing", Eniwetok, MI 1956 lead element L to R) B-66, B-52B, B-47E second element F-84F, B-57B, F-101 not information are F-84F and Navy A-3D



B-47 "Bubba Boy" weapons effects test aircraft and flight and maintenance crew from "Operation Redwing" Eniwetok, MI 1956. Rear row L to R) Major Claude Brown co-pilot, Captain Tom Sumner (glasses) pilot, Captain Joe Dean (cap) navigator.



The XB-47 (s/n 6065) in flight near Moses Lake, Washington Test Base in 1948.

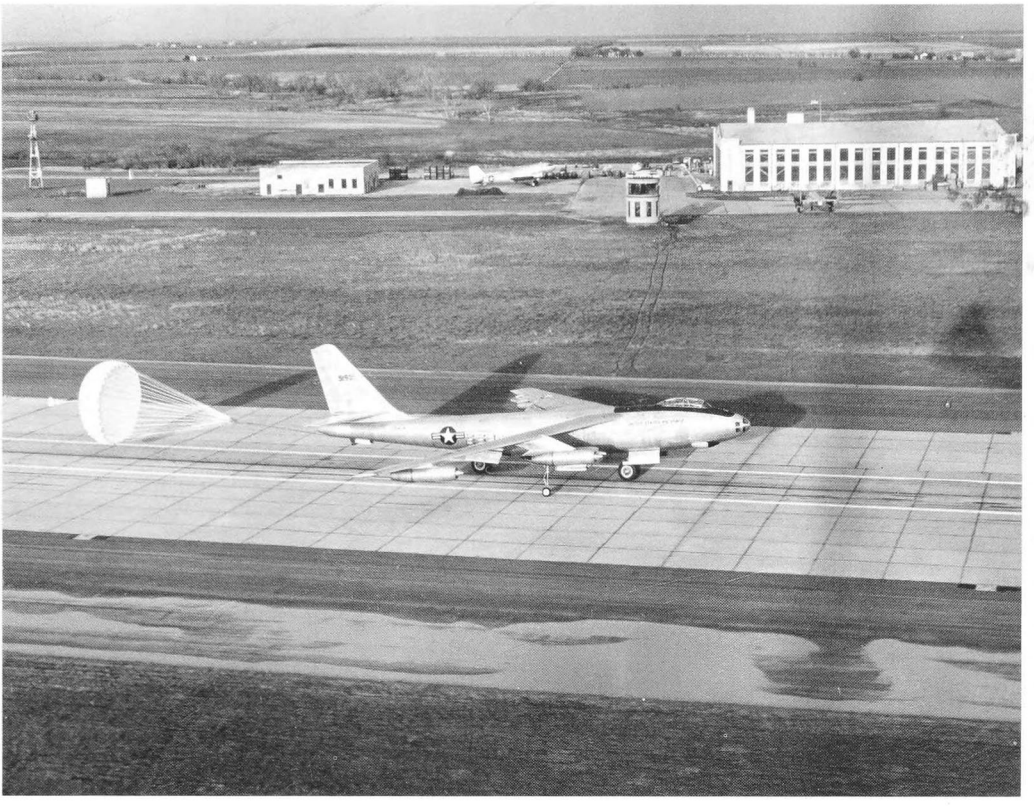
The Boeing XB-47 is shown taking off with the aid of its 18 internal JATO rocket units.

A B-47A shown during a test flight over Kansas.

A B-47 Stratojet is shown hooked up to the Flying Boom of a Boeing KC-97.

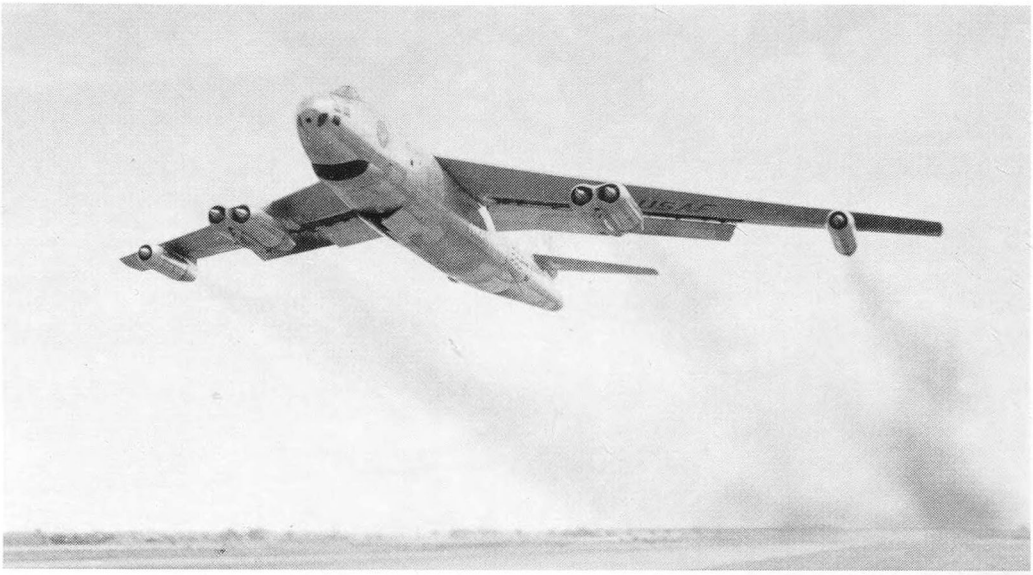
XB-47 # 1 (s/n 6065) left rear view.

Wichita built Stratojets number 1,000, and 1,001 shown during a test flight.

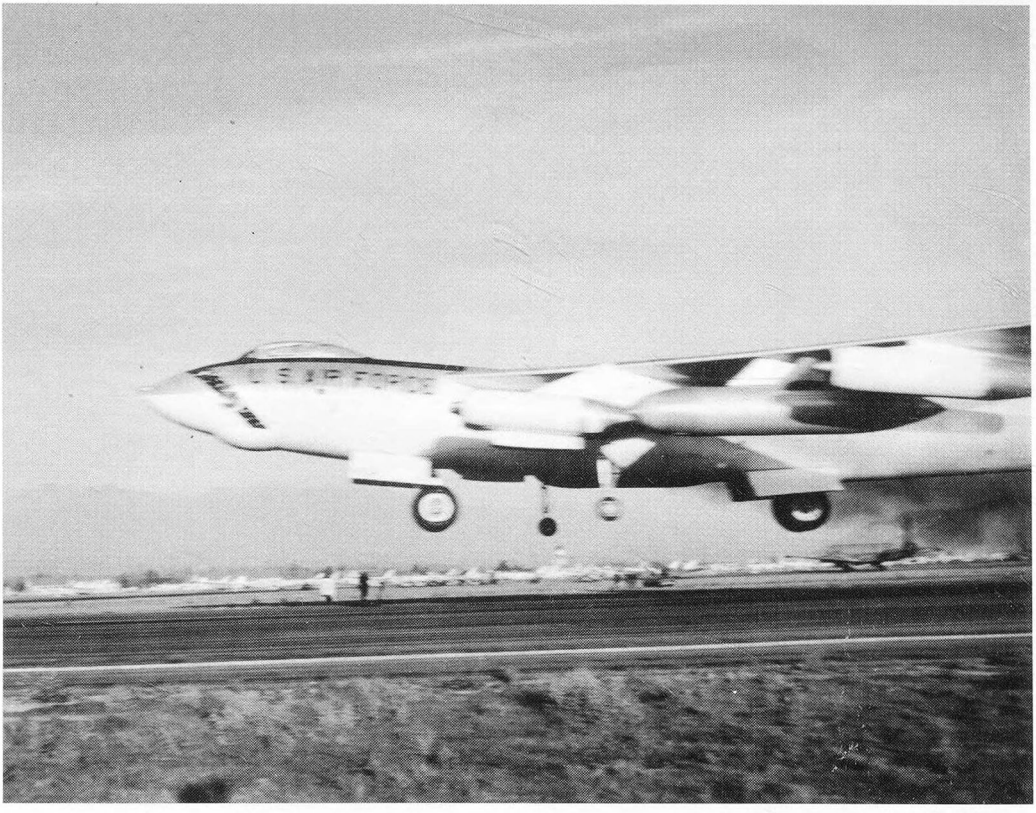


B-47A (s/n 91905) lands with drag chute deployed.

Major Bob Halliday, Boeing test pilot "Tex" Johnston, unidentified, and Major Jim Bauer pose with the #2 XB-47 (s/n 6066).

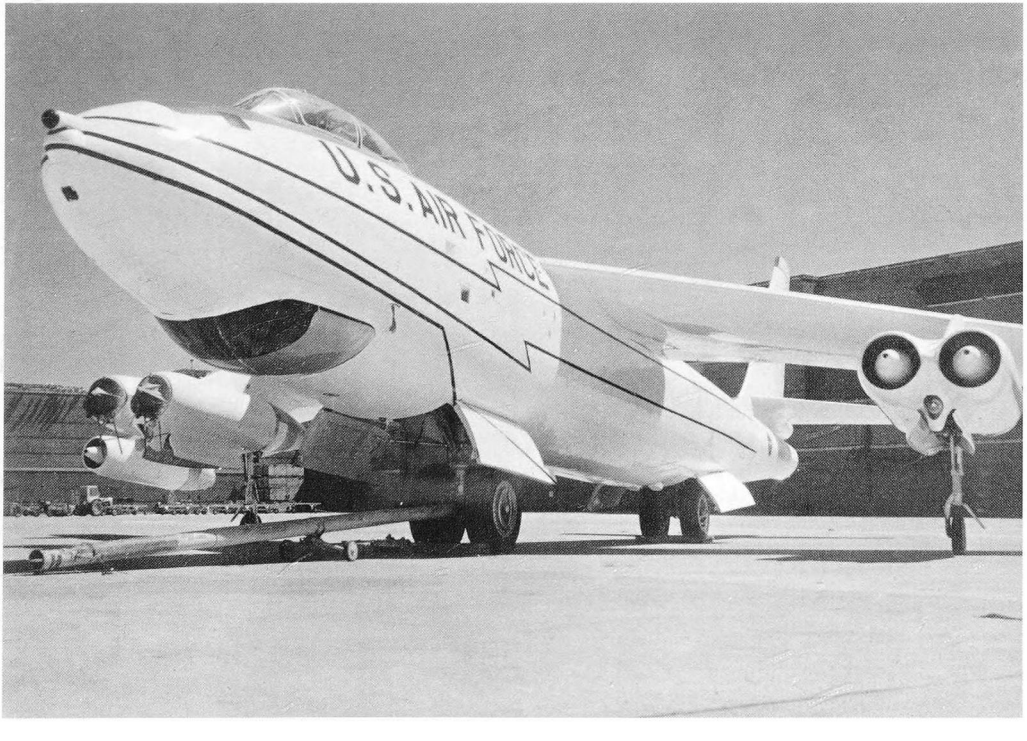


Gear up! B-47B takeoff.



B-47E "Full Power Take off" at March AFB, CA.

A B-47B (s/n 0076) with brake chute deployed arrives at March AFB, CA.

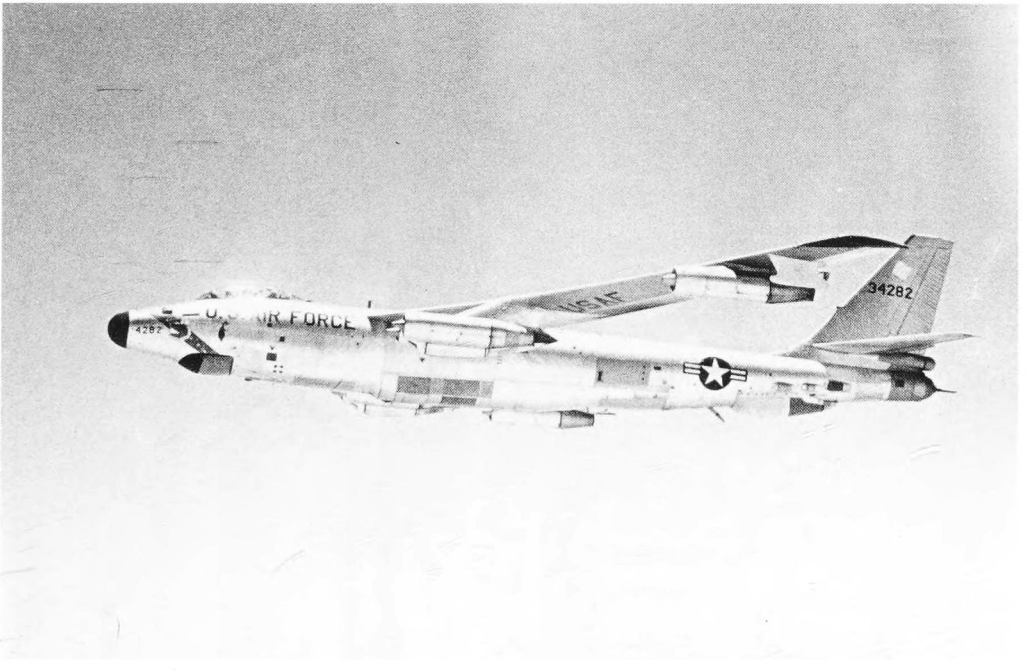


An all white B-47B

The last operational USAF Stratojet, WB-47E (517066) sits on the ramp at McClellan AFB, CA on October 29, 1969. The following day, it was flown to Renton, WA where it was turned over to Boeing.

B-47s taxi onto the runway at March AFB, CA.

A dramatic B-47B (s/n 512237) ATO take off.



This in-flight photograph of an RB-47H (s/n 534282) demonstrates the highly modified three-man Crow's compartment in the center section as well as numerous ELINT antennas on the rear fuselage.

The pilot and co-pilot conduct a pre-flight walk around of a 55th SRW RB-47H.

The swept-back wings and Fowler flaps of the B-47 are evident in this photograph.

Their mission completed, a B-47E (s/n 36218) taxis back to the hangar.

Sporting a white anti-flash paint scheme and external wing tanks, this March AFB based Stratojet awaits its next mission.

Testing the external 33-bottle ATO system at Edwards AFB, CA.

A Pease based 100th BW B-47E (s/n 52-0374) circa 1965.

The WB-47E Arc Light Mission Loon 99

By Colonel Charles N. D. Smith, USAF (Ret.)

Shortly after B-52s started regular bombing missions from Andersen AFB, Guam into Vietnam in the 1964-65 time period, WB-47Es of the Military Airlift Command's 9th Weather Wing were tasked to perform weather reconnaissance of the B-52s refueling areas. These WB-47 Arc Light missions started flying from Clark Air Base in the Philippines in the late months of 1965 and for the first half of 1966 on a TDY basis by the 53rd Weather Reconnaissance Squadron (WRS) from Hunter AFB, Georgia. The 53rd was a part of the Air Force's 9th Weather Wing at McClellan AFB in Sacramento.

The 53rd WRS achieved its fame as the Air Force Hurricane Hunters. When I first joined the 53rd at Hunter in 1965, the hurricane hunting mission was flown jointly by the squadron's WC-130s and WB-47Es from both Hunter and Ramey Air Force Base in Puerto Rico. The WB-47Es were converted B-47E bomber aircraft, identical except for two features: the air refueling system had been disabled – presumably to relieve a resource load to the SAC tanker fleet – and a weather recording drop-sonde system which replaced the 37mm cannons in the tail. You ask how could a B-47 perform as a hurricane hunter? Obviously with a lot of care – we circumnavigated the storm or overflew it, taking constant radar fixes and using the weather drop-sondes for atmospheric readings at varying altitudes, and using the Mark XII eyeball as backup. And you can believe that even at a reasonable distance from the eye, the WB-47's wings showed us how flexible (and strong) they were! Needless to say, we left the flying through the eye at 1,500 feet to the C-130s!

The early Arc Light TDY support missions were flown to assist the B-52s in finding the best areas and altitudes to perform their air refueling on the way to and returning from Vietnam. These weather recce flights proved so successful for the B-52s that the 53rd's WB-47s were PCS'd to Clark in mid-1966. The transfer included all of the 53rd's WB-47 aircraft, flight personnel, maintenance personnel and support equipment. For administrative purposes, we were all transferred to the 9th Weather Wing's 57th WRS at McClellan AFB, and designated as the 57th's Detachment 2. As I recall, Detachment 1 of the 57th was flying WB-47E's at Eilson ARB Alaska.

The transfer from Hunter to Clark was well organized and the move was fairly fast, based on the experience that the squadron had shuttling between Hunter and Clark for about eight or nine months. We took seven WBs to Clark along with fourteen pilots, seven navigators, and our own maintenance squadron. All of our pilots were dual qualified as both Aircraft Commander and Co-Pilot because we

didn't have fixed crews as we had in SAC, and the ability to swap crew positions gave us excellent scheduling flexibility. The SAC requirement was for Det. 2 to fly three reconnaissance missions in every twenty-four hour period, and to fly additional missions beyond those scheduled when an in-flight abort occurred or when asked to do so by SAC. In essence, that meant at any one time we had at least three flight crews in the pipeline: one flying, one in flight preparation for the next designated take-off, and a 3rd in crew rest. We also flew a USAF-tasked classified mission over the South China Sea on a regular basis. The schedule was difficult because we had only the twenty-one Officers who made up the flight crews, and none additional, yet we also had to run the detachment like any other squadron, with most Officers having at least one additional duty. And since we were in a "Shopping Zone," we had a LOT of visitors come over to "help" us with our problems! As I recall, we had fifty-two sets of staff visitors and inspectors in the 2 years that I was there! And also as I remember, none of the visitors flew the 47, although many did go along for the ride in the aisle seat! These visits generally took a lot of preparation, and so the crew schedule required frequent changes to support both the flying and the non-flying events. All in all, anyone that really enjoyed flying could volunteer to spend a lot of time in the air! In my two years time while PCS at Clark, I flew 105 missions, or about 700 hours, probably lower than most of the pilots, since I had additional jobs as the Squadron Executive Officer, Personnel Officer, and Administrative Officer, and was also responsible to support the staff visitors and inspectors through our various operations.

The Arc Light Support Mission itself was our meat and potatoes, in any case. The mission was generally flown at 26,000 feet, the then normal altitude for the 52s to refuel, and were limited to about seven hours because of the disabled air refueling systems. We had canned tracks with primary and alternative refueling areas to recce, but normally we flew the same track on every mission. It consisted of two primary refueling areas, one about 200 miles north of Luzon, and another about 200 miles south of Luzon. We had a lot of variations in the tracks and altitudes when the weather was bad of course, and as many of you know, the weather in and around the Philippines was bad a lot of the time. There were monsoon rains for eight to ten days when the Inter-Tropical Convergence Zone passed through Luzon in January and August, as well as heavy thunderstorm activity during most of the wet season after the August monsoon. The dry season was a pleasure because the sky was almost always blue and clear, with stable air, and the flights were truly enjoyable. A portion of our southern flight track went over Mt. Mayon, a volcano with a "perfect" cone, very much like Mt. Fujiyama in Japan. It was always a beautiful sight, but one fateful day in 1968, Mt. Mayon erupted violently, driving hundreds of citizens living at its base from their homes and causing us to

fly close to and occasionally through its sulfur cloud for several weeks! The one thing that never changed about our mission was our call sign – we were known as Loon 99, or as we spelled it out, Loon Niner Niner. Every Arc Light Support flight used that same call sign for the two years I flew those missions.

In additional to normal squadron activities, operations, maintenance, flying safety, administration, personnel, etc., we were required to maintain a control room – a la SAC – to monitor flight activities and to pass weather information that we gathered to our customer. In the early days of Loon 99 missions, the weather messages were sent directly to SAC at Andersen by secure voice. We were told early on that these secure messages were being intercepted by the enemy, thereby revealing B-52 strike times in Vietnam. We worked with the Air Force Communications Service, but were unable to pin point the source of the leaks. To solve the problem, we went to an unusual extreme – we started sending our messages from the aircraft to the control room by VHF radio calls in the clear, and then used an unsecured telephone line from the control room to pass the results in to SAC at Andersen! Strange, but apparently the enemy never considered monitoring the "easy" way, which we ended up using, but we were never knowingly intercepted again.

Shortly after I left the squadron in 1968, the WB-47s left Clark and began phasing out of the inventory. The next time I saw either a B-47 or a WB-47 was on a TDY trip to Davis-Monthan AFB in Tucson, Arizona – the entire fleet of about 1700 were all lined up herringbone fashion – one headed East and the next headed West and so on, row after row after row – in the "bone yard." After having flown the B-47E with SAC in the 341st Bomb Wing's 12th Bomb Squadron at Dyess for three years, then with the 53rd WRS and Det. 2 of the 57th WRS for another three years, seeing them lined up like that in the bone yard tugged at my heartstrings! While I was flying the forty-seven operationally, I never thought I'd miss it when my days with it were done, but today I think about those days with good memories, knowing that I had my time with one of the best airplanes ever built. Goodbye B-47, good-bye Loon Niner Niner.

Radio Silent

By Lt. Colonel Bruce Bailey, USAF (Ret)

All of our RB-47H "operational" missions were conducted under strict radio silence as another security measure. We proceeded with preflight up to engine start, then waited. At the briefed time, we watched the tower for a one-second flash

of a green light. That was the clearance to start engines. At ten minutes prior to scheduled takeoff, we received two flashes of the green light as clearance to taxi. While taxiing out, a call would go from the tower to an imaginary airplane, giving it landing instructions. That call both relayed all meteorological information we needed for computing takeoff data and reserved the runway for us. We lined up on the runway, set the brakes and waited. At exactly one minute prior to takeoff we received a steady green light from the tower, clearing us for takeoff. Power was brought up and stabilized and brakes were released at precisely the briefed time. A red light from the tower at any point during that process would return us to the parking area.

We would sneak into a base and keep the airplane hidden, except when flying (and most of those were at night). We were usually at a base where there were no other B-47s. It didn't take long for everyone on the base to know that the lone, weird, secretive airplane was some type of B-47. We followed the radio silent routine religiously and tried to conceal our presence. But after going through all the secrecy and lined up on the runway, waiting for the steady green light, invariably some clown in an F-102 or such, wanting to land, would get on the radio and transmit, "Hey, tower, when is this B-47 going to takeoff?" So much for secrecy.

It was all rather futile in most areas anyway. When you were the only B-47 at a base, you stuck out like a sore thumb when venturing out onto the taxiways and runways. Our normal takeoff procedure was to pull the overweight drag queen into air when at the end of the overrun. In those days, nothing else made as much noise as the B-47 (running across two counties to get airborne). Add to that water-alcohol injection. All that noise and a trail of heavy black smoke for three or four miles made sure anyone with a brain knew a B-47 was attempting to aviate. Stealth was not one of our strong points.

Radio silence caused serious problems at times also. All refuelings were strictly radio silent. We would hit the tanker and get the scheduled offload well prior to the end of the refueling track. Then we would top off again just before reaching the end of the track. It was common to let the newer copilots attempt a few connects in between. On a couple of occasions, the copilot would get the airplane so out of shape it would scare the Boom Operator and he would initiate an emergency breakaway. There was no way we could call them back, so we had to fly with a marginal fuel load.

Returning from one of those missions was also quite a challenge at times (especially with the RAF and Turks). We still remained radio silent, so we were treated as an enemy penetrator. We always hoped they would get close enough for a visual identification before they started firing. But even that was difficult when we flew with no markings or numbers on the aircraft. Fortunately, nothing else

looked like a B-47, helping to convince them that we were friendly to some extent. The RAF really got chapped when we tracked them with the twin 20MMs or had to jam their radars when they got too aggressive.

Once, an RAF Lightning intercepted us and seemed rather trigger-happy. Our RB-47H had no numbers or markings on it, adding to his indecision. He tried to get us to answer him on the radio several times, but we remained radio silent. Finally, he stated, "Unauthorized aeroplane, identify yourself immediately or I will open fire." At that, the copilot pointed the two tail cannons at the Lightning and let the radar lock-on.

The bloke instantly responded, "Tally Ho, identification received and understood. Have a jolly day, chaps."

Why Don't You Fix the Bloody Thing?

By Lt. Colonel Bruce Bailey, USAF (Ret)

We were assigned to an RAF base in England, while flying a normal RB-47 temporary duty project. Everything we did was so highly classified that no one knew who we were, where we came from, what we were doing or anything else about us. They only knew that we kept our airplane hidden most of the time and didn't associate with others on the base. On the rare occasions that they did get a glimpse of our airplane, they knew it was very different and they had never seen anything like it. All that secrecy led to great fear and distrust by other base units. Rumors ran wild. Being distrusted by all support units and unable to tell them what we needed or why, led to many incidents. We became very creative at liberating, confiscating, borrowing and stealing everything we needed – and quite often, whatever we wanted. Our reputation (but nothing else) was well known all around the world. That resulted in an RAF Wing Commander, the equivalent of a full Colonel, being assigned to us to prevent as much stealing as possible, or at least try to keep a rough count on what we took.

He was not permitted to sit in on any of our mission briefings or debriefings, but was always there for each takeoff and landing. He had witnessed three missions and was astounded to see the crew, after each landing, pile out of the airplane and immediately go check the forward main landing gear. He knew enough about our operations to know that on each mission we went out and diced with Soviet defenses and sometimes came back with an airplane full of holes. He surmised that the problem with the forward landing gear must be quite critical to draw such attention after getting back on the ground after being chased and shot at.

He approached our Detachment Commander and said he had noticed the crew's keen concern over the landing gear. He recommended that we stand down long enough to fix the bloody thing before it did to us what the Russians had been unable to do.

Our commander laughed as he explained to the very proper Englishman that the left tire on the forward landing gear had been divided into six equal segments and each was labeled with a crew position. Upon landing, the crewmember whose segment was at the bottom when the airplane was parked had to buy the drinks for the night.

The RAF type kept his hand on his wallet as he walked away, knowing that history must be wrong, there was no way in the world the British could have lost a war to those people.

Seventh Man

By Lt. Colonel Bruce M. Bailey, USAF (Ret)

When the RB-47H landed at another B-47 base, it would blow the ground crew's minds. First, it didn't look like any B-47 they had ever seen. It had a big black nose; pregnant fish belly, black radome patches all over and stuff hung onto it everywhere. Then a couple of security policemen were assigned to guard it, even though it was parked in the secure area with all the armed alert bombers.

The first Raven out of the airplane was asked about the fuel load. He would point up the ladder and reply that the copilot was still in the airplane. The other two Crows went through the same ritual when coming down the ladder. The crew chief could accept that, as it was common for a fourth man to fly on a B-47. But when the navigator got out and pointed back up the ladder, the sarge knew someone was pulling his leg. He would be about to follow the four to the bus, when a fifth body came down the ladder. He just stood there, afraid to ask. When the aircraft disgorged a sixth man, the chief walked back to the maintenance van, handed the forms to an airman, sat down and began figuring how close he was to twenty years.

It got even better after the Silver King Mod, when the large ALD-4 pod was hung on the right side behind the crow compartment. Before the ground crew recovered from the shock of six men emerging from that one B-47, one of us would go around to the pod and begin talking to the imaginary man inside it. We would tell him where we had landed, that we would be staying overnight and that food and coffee would be sent out to him right away. Then we cautioned the crew

chief to be sure that no one plugged the air intake in the nose of the pod, because the man in there would suffocate. All the ground crew watched the pod closely, suspiciously. It was common, as we drove away, to see one of the ground crew talking to the man in the pod or knocking on it to get his attention.

Still, curiosity was a powerful force. In spite of all the warnings and threats, some would try to see what was inside the mysterious bomb bay compartment. While pretending to check something in the cockpit, or sometimes when the aircraft was being refueled, one of the ground crew would venture down the crawlway. We kept the cover closed on the window in the hatch into the compartment, so it wasn't possible to see inside without opening the hatch. For a while we had a padlock on the hatch, but someone decreed that was a safety hazard, so it was eliminated.

Different crews did different things to protect their secrets. On my crew, we procured a bear skin and rigged it up on a spring-loaded arm. Its trigger was tripped when the hatch opened all the way. It was necessary to open it all the way before a man could go through it or see much in the compartment. We attached about a dozen stiff wires to the arm and arranged them so they would scrape across a piece of plexiglas. We put a liberal quantity of grease on the bearskin and set the trap.

When the hatch was opened, the bearskin flew right into the face of the intruder and the scraping wires made an eerie screeching sound. It not only scared the crap out of the intruder, but also covered him with heavy, black grease. We never lost anything from the crow compartment, but did find a crawlway stained with other than grease from time to time.

Recollections of a B-47 Pilot

By Colonel Leslie E. Gaskins, USAF (Ret)

As I will be using first names in these tales of daring do, a little introduction is necessary. The Wing Commander of the 321st BW was Colonel Mike McCoy, one of the pioneers in the B-47 program. The Wing Director of Ops was Charley Joyce who was a real character (died with Mike in the crash). Our Squadron Commander was Raymond F. Johnson, a great leader and one of the best stick-and-rudder men I ever flew with. My crew at this time consisted of Richard S. Brown, a Merchant Marine Academy graduate, and Leon M. Burgess, our Navigator. They were both great crewmembers and friends.

As I said, Mike McCoy was one of the pioneers in the B-47 program and I guess he knew as much about the plane as any one in the Air Force, although the

plane eventually killed him. Unfortunately that didn't turn out to be much. For example, I remember leading my flight back from a mission to Goose Bay Labrador. We kept being assigned higher and higher altitudes by Air Traffic Control until we reached what was our first experience with "coffin corner" where the plane's low-speed and high-speed stall came together.

Under this condition when the nose was pulled up to maintain altitude, the plane would lose a few knots of air speed and enter a low speed stall. When the nose was lowered to recover from the low-speed stall, the plane would immediately gain a few knots and enter a high-speed stall. The result was six B-47s fluttering down from altitude with much buffeting and shaking on the part of the plane and much anxiety and shaking on the part of the planes' crews! We fluttered down about 5000 feet until the spread between the two stall speeds had widened enough to fly the plane comfortably.

When we first formed the Wing, our B-47s were without wing tanks and thus were very maneuverable without the drag of the tanks. One-day right after the new wing tanks were installed Dick and I were sent to test-fly one of the planes. Unfortunately, maintenance had put on a full load of fuel rather than the lighter fuel load specified for test-flights. One of the procedures for the test flight required us to climb to 35,000 feet and check the engine RPMs at idle throttle setting and a Mach of .74. We climbed out over a thick layer of clouds and broke out about 30,000 feet over Tampa.

As we continued to climb to 35,000 feet, we found that the plane just didn't want to go that high and keep shuddering on the edge of a stall. I would dive down to pick up some speed and pull up to try gain. We finally got to 35,000 feet and I reduced the throttles to idle and began calling off the Mach to Dick who was to record the data. Suddenly, the plane shuddered and I knew we were about to stall so I followed the appropriate procedures by dropping the nose and adding full throttle. The shuddering stopped and after gaining some speed, I eased back on the stick to gain level flight. About that time, all hell broke loose! The plane started bucking violently in a secondary stall and just flat starting falling out of the sky. We fell about 5000 feet down through the clouds until finally we reached an altitude where the air was thick enough to keep us flying. In the meantime with all the shaking and falling number six engine flamed out and quit running.

When I recovered my composure, I called back to Dick, (trying to keep the quaver out of my voice) "Well- what did you think of that?" "Lets land this damn thing" was the response, which seemed like a good idea and so we did without further incident. New lesson learned – the B-47 wouldn't fly as high and as fast with those new wing tanks.

We were told that we would soon be deploying to England through North Africa and so we had to press on with In-Flight Refueling training. We didn't have our own tanker planes in the Wing as most other Wings had so we had to beg for tankers to train on and they were very scarce. As I had been Ray's instructor on in-flight refueling in the B-50s Ray decided that I didn't need the training and he would use the available tankers to train the other crews. So all I had was the required two check outs, one in daytime and on at night. I wish I had shared Ray's confidence in me, but the In-Flight refueling was quite different from the B-50. The B-50 refueled with other prop driven tankers who flew at the same speed and altitude while the B-47 was required to approach the tanker from high altitude.

The tankers normally refueled us at 15,000 feet while we approached the tankers from somewhere above 30,000 feet. When our radars (by receiving the tanker's radar beacon on the navigator's scope) told us we were a certain distance behind the tankers (about thirty miles) we went to idle throttle and started a descent at 310 knots. The tankers were cruising at about 270 knots. The idea was to level off 500 feet below the tanker's altitude and decelerate from 310 knots at four miles behind the tanker matching the tanker's airspeed and about fifty feet behind and below the tanker. There we stabilized our approach to the tanker and then slowly closed in to a position about fifteen feet behind and below the tanker. Once in position, the copilot opened a door in the nose immediately in front of the pilot and the boom operator in the tanker would fly a telescoping boom to place the nozzle into the B-47 refueling receptacle.

One of the problems novice B-47 pilots had was that if the boom operator pushed the boom into the receptacle with too much pressure (and he had 3000 pounds) available, it would push the B-47 nose down. The B-47 pilot would automatically react by pulling the nose up which would push the tanker's tail up which dropped the tankers nose. The tanker pilot would pull up on the nose and the tanker's tail would come down. This cycling caused a porpoising motion, which if not canceled out would eventually pitch the B-47 off the boom.

Another problem was the B-47 had to refuel at a speed only a few knots above stall even with our flaps down which made control very slow and sluggish. As we took on fuel, we grew heavier which brought us even closer to stall. If we were really taking on a lot of fuel, the tanker had to start a descent in order to pick up his speed and keep us from stalling.

As I was much impressed by the problems of refueling the B-47 and as I was going to lead the first flight to England via North Africa and didn't want to fall on my face. I started flight planning for every possible in-flight refueling eventuality. I was so busy for several days planning for every 1,000 pounds of fuel that I might be short that I didn't have much time to be sociable. Several friends wanted to visit but I told them I was busy flight planning.

The day arrived for the deployment of my first flight of six planes. I really wanted to impress my flight with the necessity of precision so we planned for all six pilots to hit the number three starter on my count. Sure enough, I got on the radio and counted down, "Standby to start number three on my count down." "Five, four, three, two, one, Go." With that, all six of us hit our starter switch at once. What a commotion! We had overloaded the electrical ground units (800 or 900 pound carts connected together by heavy electric cables). The units promptly flipped over on their sides and we lost all power to start the engines.

By the time the ground crews got the power carts untangled, we were very close to our take-off time and pride demanded that we make on-time take-offs. With that we went screaming down the taxiways headed for the runway doing about 80 miles per hour with old Mike McCoy waving us to hurry! We made the take-off time and learned a lesson-never try to start six planes at one time!

The flight was uneventful for about an hour despite the fact that on checking in we found out that only one plane in the flight had an operative radar set and he later lost his radios. We were supposed to meet our tankers for refueling over Savannah Georgia, but for reasons I can't remember they weren't where they were supposed to be and we chased after them finally catching them around Charleston. The refueling was uneventful (much to my relief) except that we were hundreds of miles north of our planned route when we finally finished and climbed back to altitude.

I guess this is a good place to say a few words about our planes. They were the same "B" models that we trained in as students. They were old and beat up from so many student landings. Very few of the radar sets could be counted on to run for any length of time if at all. My plane had a problem with the landing gear doors, which would not close all the way, which was not good as they might tear off. We soon found that if we opened the bomb bay doors after the gear was up the spoilers would create a negative pressure and suck the gear doors shut. Unorthodox but it worked.

We departed the east coast of the U.S. and headed for North Africa. It was a daytime flight, which prevented us from doing any accurate celestial navigation. We would be out of radar range of the coastline for many hours, which didn't make much difference as the only plane with an operative radar set soon lost his radios and couldn't tell us anything. So we plowed on ever eastward as they say. It soon became evident that we were going to be marginally low on fuel when we arrived and we weren't exactly sure when that would be. We finally picked up the radio beacon from the Azores and I diverted the plane with the lowest amount of fuel remaining to land there. I was afraid that with our low fuel condition if we ran into weather, which would slow down the landings, we would be in trouble.

Through all this, I could hear Mike McCoy leading the second flight a couple of hours behind us. I figured if he wasn't worried about fuel we must be O.K. Finally after what seemed an eternity we spotted the shore of North Africa and, although our fuel was lower than normal we really didn't have a problem and the flight landed uneventfully as did Mike McCoy's second flight.

The third flight was not so lucky. They arrived over the field at night and in bad weather. We had not been able to get accurate information about the radio aids. As a result Dale Cooper got lost and his crew had to bailout in the Atlas Mountains. All four crewmembers were picked up by Berber tribesmen who returned them to our base at Sidi Slimane about ten days or two weeks later.

Dale said that the loneliest sensation he ever experienced was being all alone on the plane with nothing but twelve red empty-fuel lights staring at him! He and his crew were very fortunate. They were the first crew to successfully bailout of the B-47 before the advent of the ejection seat. The only reason they were successful was that the plane was still under control and on autopilot when they bailed out.

At Sidi everyone had a good night's sleep and were raring to press on to England! But, as we checked in to operations the next morning we were told, "Weather at Lakenheath England is forecast to be below minimums at your scheduled arrival time. The mission is delayed 24 hours." Everyone was disappointed, but we headed back to the barracks to kill time until the next day and to sweat out word of Dale Cooper's crew, which we weren't to hear from until we reached England.

The next day we went charging down to operations early in the morning only to be told, "Relax troops there's no chance of the weather clearing for another twenty-four hours." By this time we were all bored out of our skulls so the crews fell back on what they knew how to do best-have a party! So the drinking and the poker games soon were going full blast. My crew kept urging me to buy a German beer that was on sale at the PX. I would go buy a case and slide it under my bed while the rest of the crews would pull the case out the other side and drink it. Being a sprinter at parties, I was in bed and asleep by 6 PM.

Around midnight we were awakened and told to report to operations for briefing. The weather in England had cleared and we were to take off at first light! What an operation that was! Half of the crewmembers were either drunk or hung over. I still remember hearing one pilot in the back of the briefing room whispering loudly and repeatedly, "What did you do with my damned Flask!" I saw some of the fellows having to be boosted up the ladder into the plane. But the absolute topper was one of our bolder pilots who had decided to go outside the base to the local nightclub. He was sitting there with a dolly on each knee when he heard a roaring sound and looked out the window to see the B-47s taking off! He was a little late, but as far as I know, no one ever said anything about the incident. Copi-

lots are forever pleading, "Let me make this take-off: or let me make this landing." But as we were taxiing out, I said, "O.K. Dick she's all yours." The only response from the back seat was a hangover groan.

Ray really pulled a slick stunt: We knew that sometime in the first few weeks the Wing would be ordered to execute a No-Notice Unit Simulated Combat Mission (USCM) called by headquarters to test the Wing's combat capability. One Saturday at our crew roll call Ray said, "I want all you crews to be in bed by 6 PM and lights out." He gave no other explanation. We all dutifully hit the sack at 6. I was lying there reading when Ray knocked on the door, "I said lights out."

At midnight Ray got us all up, in our flight suits and loaded us on a truck to the mess hall where we had breakfast. As we finished and were turning in our trays the Klaxon went off indicating the USCM was executed! One of my crew was ill so I didn't fly, but sat in the jeep with Ray to watch the planes take off. It was amazing! The other two squadrons were caught flat-footed! The first fourteen planes off the ground were in our squadron (each squadron had fifteen planes). To the day he died Ray would never tell me how he found out about the mission.

One of the most interesting projects my crew was assigned was to fly with General Jim Edmundson, then Deputy Director of SAC Operations from Orlando to Hawaii-to Guam-to North Africa-and back to Orlando. We flew up to SAC Headquarters at Omaha, picked up General Edmundson and returned to Pinecastle. While we were at SAC Headquarters, they installed a new radio in the plane called "Single Side Band" which was supposed to be the latest in long-range communications. When they finished they quickly showed me the controls and off we went to Orlando where we spent a couple of days planning the flight and scheduling the in-flight refueling support we would need. I also gave General Edmundson a couple of flights in the B-47 to bring him up to snuff. He did very well except that in the beginning he flew his approaches too fast.

We took off for Hickam AFB, Hawaii in-flight refueling over the West Coast. My only problem was I couldn't contact anyone on the new Single Side Band. We went whistling along into Hickam without being able to really talk to anyone on the radios. When we got on the ground they said they had launched interceptors after us but they couldn't catch us! The General didn't seem a bit concerned so they let the whole thing drop, but I wasn't too happy about the radio, we might need it if we had any problems out over the water.

The General was very nice to us and provided us with a staff car & driver so that we could tour the island for one day while he conducted some business. The next day we took off for Guam, which was uneventful as no in-flight refuelings were required. When we arrived at Guam I had a pleasant surprise. General PK Carlton, whom I had known at Roswell, was Director of Operations, and as he was

going on a trip, he lent my crew his staff car. We spent a day there and all I can remember is playing on a golf course full of giant snails, which squished when you stepped on them.

While at Guam, I got together with the communications staff about my radio. They furnished me with new frequencies and call signs after which we had no problems at all. When we flew non-stop from Guam to Sidi Slimane North Africa, we were still chatting comfortably with Guam when we were over Goose Bay, Labrador. We only signed off with Guam because we were in touch with Sidi Slimane. What a great invention!

We took off from Guam and topped off our tanks over the island with a couple of tankers and set off on the great circle route to North Africa. The route led us over Tokyo where we hit two more tankers. The route then led us uncomfortably close to Russia who wasn't too friendly in those days. It was an eerie feeling to watch my radar early warning system blink and listen to the sweeps of the Russian radars as we flew through the night and I cautiously edged further out to sea.

I was having a pretty good time sitting in the back seat (where I had been since Pinecastle). Guam had given us about a ton of ice cream packed in dry ice and I was working my way through it. All I had to do was take star shots for the navigator. We hit three tankers over Eilson Alaska and three over Harmon, New Foundland. When we got to North Africa, we still had enough fuel to go on to England.

After a couple of days at Sidi Slimane we cranked up and went home to Pinecastle. Again non-stop with two tankers over Bermuda. When we landed we found that the flight was some kind of a minor record for the longest point-to-point jet flight. It really wasn't much to brag about, but we did get a lot of news coverage and speaking tours. I got tired of Chicken a la King the main luncheon staple in those days.

The year 1957 was a very interesting year for the 321st Bomb Wing. We were used as the show or demonstration Wing which entailed flying a lot of special projects and air shows. Three of the demonstrations were especially interesting. We were tasked to participate in a flyover at Bolling AFB in Washington D.C. for General Twining who was retiring as Chief Of Staff. I believe that was the last large scale massing of bombers and tankers. In those days we had over 2000 planes. We flew two or three practice flyovers to get ready. It was fairly complicated. Every wing in the Strategic Air Command and each wing flew about 30 planes in the flyover. The wings joined the flyover from all over the U.S. from Holmstead, Florida to Spokane, Washington.

I led our Wing of thirty planes, which formed up in the standard box formation. At the same time all the other Wings were launching so as to meet at the right time to join in the flyover of Bolling AFB. Each Wing flew to a designated radio

navigation station and circled waiting for the Wings located further away to fly by and then join up. We were circling over Cincinnati at about 30,000 feet and at the specified time we saw a large black speck growing in the sky to the west. The speck was the thirty airplanes from the Wing we were to follow into Bolling. We knew that there were several Wings in front of that speck so we were very careful in falling in behind the approaching Wing. When we were in position, the Wing ahead of us fell into a trail formation consisting of ten sets of three airplanes. The last Wing in the line could thus be easily identified because it formed a large formation rather than a string of threes.

It was really a wild ride after we fell in behind the Wing ahead of us! I have never seen such turbulence! Our plane was rolling into thirty and forty-five degree banks in each direction. It took all the aileron we had to stay in the sky. About forty-five minutes later we were heading south about fifty miles west of Bolling. From that point each wing started letting down to 300 feet off the deck while flying a giant loop extending for about 200 miles south before turning towards Bolling. Then things got worse! The jet wash and turbulence were fierce plus we had to counter the accordion effect. When the leader of the flyover changed his airspeed a few knots the planes at the back had to go from idle to full throttle to hold position. As I passed over Bolling, the flyover leader called in over Baltimore and we were in the front half of the flyover! The scene on the ground at Bolling must have been something! Nothing but the roar of jets and black smoke as hundreds of jets swept by at 300 feet. Old Mike was flying with me and we were both impressed.

Our Wing was also chosen to do a flyover as part of the annual Fire Power Demonstration at Eglin Air Force Base. This was a really big deal for the Air Force as it was attended by most of the influential people in Washington and impressing them was very important if we were to get proper funding for the Air Force Programs. I had one of the greatest flying times of my life. Charley Joyce, the Director of Operations was to lead the fly over and I was to be deputy lead in case he had to abort. We practiced for about ten days. Each time we would take off from McCoy with me flying on Charlie's wing and fly low level out across the Gulf of Mexico to a timing point off the coast of Eglin where we would practice timing our orbits to arrive over the reviewing stand exactly on the scheduled second. Flying all that formation was just great fun.

We also learned a lot about some of the peculiarities and dangers of flying formation in the B-47. We had previously lost two crews as the result of a mid-air collision. One plane was having trouble with its landing gear and asked the other to come in close and take a look at the problem. As the other plane closed in from the rear, the pilot experienced increased down wash from the first plane requiring

him to exert more and more backpressure on the elevators. When he passed under the first plane, the down wash suddenly ceased and as the second plane was only a few feet below the first plane he could not release the back pressure soon enough and his plane nosed up violently crashing into the belly of the first plane. The crash killed both crews.

While we were flying formation with Charley, we had numerous opportunities to thoroughly explore the down-wash patterns and brief the other crews.

Flying with Charley as lead was some experience! As we passed by the reviewing stand at 300 feet for the actual fly-by with 30 ships in tight formation, Charley decided to really tighten us up. He chopped his throttles to idle! Fortunately we didn't run in to each other and managed not to break formation all over the sky until we were out of sight of the reviewing stand. The names the pilots were calling Charley couldn't be repeated in mixed company!

Another interesting project started in March of 1957. Higher Headquarters called down and asked us to make a maximum performance take off for the up coming annual Fire Power Demonstration at Eglin. They specifically wanted us to use thirty-three ATO bottles and water injection with a minimum fuel load. I met with the Boeing engineers at Seattle to go over the performance limitations we might encounter. I was surprised when I questioned them about the 33-bottle external ATO rack. They said, "We tested the rack to 310 knots and figured that was fast enough so we didn't test it at higher speeds."

We finally decided that we could load the plane with 12,000 pounds of fuel, leave the gear down to avoid any chance of gear malfunction, and do a chandelle off the runway letting the nose fall through when the water burned out with the attended loss of thrust. The chandelle would enable us to keep below the gear-down speed limitation and the positive G force would keep the fuel in the near empty tanks on the tank bottoms and prevent cavitating the fuel pumps, which could cause engine flameouts.

Mike McCoy didn't want to miss out on the fun so he decided he would take the front seat. I was disappointed, but I also felt that Mike was the best stick- and-rudder pilot in the B-47 I had ever seen. We didn't want to waste an external ATO rack on a trial run so we loaded the eighteen bottle internal racks.

On the morning of 4 March 1957 we taxied out to the runway at McCoy AFB for the test run. We went to 100% and water injection and started the T.O. roll. I can't remember the exact number of seconds I counted off backwards before we fired the ATO. I'd guess around 10 seconds. We leaped of the ground at around 1300 feet and pulled into a chandelle with the gear down. The water burned out as we passed through 4,000 feet letting the nose drop through the horizon in about a forty degree bank descending into the pattern and landing. I logged five minutes.

I thought the thirty-three bottle T.O. would be a little more hairy but really no sweat. Then Headquarters decide that the T.O. would not be spectacular enough to wow the Congressmen. They said they wanted us to take the same configuration, fly by the stands at 300 feet then fire the works (thirty-three bottles and water)! I told them they could cancel the astronaut program, as we would be the first B-47 in orbit. So, back to the Boeing engineers to check on such things as the effect on the engine airflow when the water was fired. Could the increased air density cause a compressor stall? We didn't know. Fortunately, while I was agonizing over this sort of thing, Headquarters change their minds and had a B-47 from MacDill do a LABS maneuver. Phew, what a relief!

Lonesome George

By Major John P. Noonan, USAF (Ret)

The "Lonesome George" Mission, named after George Gobel of some television and Air Force fame, was an ELINT mission conceived by Then CINCSAC, General Thomas Power. It was designed to test the alertness and effectiveness of the ECM "Blue Cradle" (Remote operated electronic countermeasures equipment) and the "manned ECM Capsule" against the NORAD Defense Systems along the Eastern Seaboard of the Continental United States, from Florida to the Northern U.S. Border. In this mission, "Lonesome George" was a single aircraft, which would intermingle with the penetrating force until the mission was apparently over. Then, Lonesome George would prove whether or not two American cities were awake and alert to their possible danger.

The 376th Bomb Wing with their "Blue Cradle" equipped aircraft and the 301st Bomb wing with the manned capsules installed in their B-47E aircraft bomb bays were selected to fly the "Aggressor" portion of the mission. My crew was selected from the 376th wing to fly the "Lonesome George" portion of the Mission.

In brief, the mission entailed the aggressor aircraft to fly five hundred miles eastbound off the coast. Then they would reverse course and assume altitudes to fill high, medium and low positions, approaching the East Coast with all equipment to jam the NORAD Air Defense system Radars. The timing must be precise to assure saturation of the defense systems from approach through "Coast in". After "Coast In", the major portion of the test was over!

Well, not quite! That is where "Lonesome George" went to work to really earn his name. We were to "Coast In" with the main body of the penetrations but

upon reaching the coast, we were to reverse course seaward and after assuming the proper distance and altitude, we would reattack New York City and Montaulk Point, New Jersey. After completing these attacks we would recover into Pease AFB, New Hampshire.

The actual mission was to be flown during the hours of darkness as befits an aggressor bent on maximum destruction with minimal loss. All aircrews to fly the mission were directed to use the same forecast altimeter setting to preclude altitude/separation conflict.

On the night of the mission we launched from Lockbourne AFB, Ohio, using MITO procedures. MITO and cell formation join-up were accomplished without incident. We proceeded to the designated descent point for our low-level portion of the mission. We measured altitude and found it to be off minus three hundred feet from that briefed. We were to fly at 500 feet above the surface of the water and that 300 feet was on the wrong side for safety. Remember, we were briefed to use the forecast altimeter setting regardless! We leveled off momentarily, at 10,000 feet in the descent and remeasured altitude. This time it was off an additional 100 feet. I did not relish the idea that we might become a submarine, but I continued the descent. I admit the uneasiness got the best of me and I adjusted (snuck) up a hundred feet. I had not much more than leveled off, when we passed between two ships. I looked left and then right and it was clear to me that we were not 500 feet over the water, in fact we appeared to be level with the ships. I realize what optical illusion can do, and particularly at night in pitch-black conditions, but I sighted across both canopy rails and it was very close. Besides, I figured a safety factor was in order. The B-47, while a sturdy aircraft would not make an acceptable entrant in the Submarine service. So I adjusted (snuck) up another fifty feet just to be sure.

We passed several other vessels enroute to the coast and since we were running with all lights off, I seriously doubt if anyone saw us. At any rate, my whole crew heaved a big sigh of relief when we finally reached our start climb point over the coast and left the murky depths behind us. We climbed to our briefed altitude heading seaward!

Our attack on New York City and Montaulk Point went as planned and we had no indication that anyone saw us on radar or visually. So in theory and in actual practice, we had successfully bombed two of our countries cities undetected and unobstructed. Fortunately, this attack was by a "Friendly" with radar bombs instead of an enemy with the real thing!

The sun had just burst over the eastern horizon as we made our jet penetration into Pease AFB. I requested a GCA, as all "Good SAC" aircrews are required to do when making a "Strange Field" approach and landing. However, due to the early

hour or whatever the reason, GCA was not available. So I proceeded with a visual approach. On downwind and base legs of the pattern, I had no problem with visibility as I was flying down-sun. But when I turned final, I could not see anything through the windshield. Therefore, I was forced to "S" turn down final approach to touchdown, using the side of the windscreen and the canopy to maintain line up with the runway. Touchdown was normal and I maintained directional control by looking left and right, staying between the runway markers. After rollout, I opened the "clamshell canopy" and curiously ran my finger up the outside of the windscreen. It left a clear mark and my finger was white. I taste tested the white stuff and found it to be salt as I had suspected. I realized the salt spray came from the low-level portion of the mission. How low was I? I don't know as it was too dark, but I am thankful some premonition told me to "climb" not once but twice!

When we were debriefed later, General Power asked if anyone in the group had flown "Lonesome George"? I stated that I had. He said "you'll be glad to know you are still alive and that neither New York City nor Montaulk Point ever painted you on radar. They had been retuning their radars after the "apparent end" of the mission and if they saw anything, they thought it was just slow falling chaff but certainly not an aircraft. So General Power proved his point, that the East Coast had gotten too complacent and our cities could be "HAD"! The result was NORAD would pay closer attention to ensure it would not happen again. So I guess that makes us all winners thanks to a Heads Up General and his brainchild "LONESOME GEORGE"!

COCO Alert

By Lt. Colonel Joseph M. Pilcher, USAF (Ret)

On January 31, 1958, aircrews of the 306th Bomb Wing were on Reflex duty at Sidi Slimane Strategic Air Base in Morocco, when a B-47 aircraft (no. 20242) on alert and therefore fully loaded and armed for a contingent retaliatory strike, was totally destroyed by fire during a "Coco" exercise. As it rolled along the runway during that exercise, the aircraft suffered structural failure of the aft landing gear. Upon such failure the aft area of the fuselage crashed down upon the runway with resultant fuel tank rupture and engulfing fire.

Now forty-two years later I, as the then aircraft commander, write of that incident as I remember it.

The deterrent alert posture of the aircraft required that it be loaded to its maximum designed take-off weight, which as I remember, was in excess of 200,000

pounds. Its load configuration, in addition to all fuel tanks full, included a 36,000-pound bomb bay cargo and an ATO rack with eighteen ATO bottles. Many will remember the ATO rack and bottles as a jet assist take off system necessary to get the aircraft airborne at such high gross weight.

Many too will remember that a "Coco" alert exercise required the alert crew upon klaxon sound to rush to their "cocked" aircraft, start engines, and upon reaching takeoff position on the runway advance power to 100% and begin take-off roll, all within fifteen minutes maximum after klaxon sound. Throttles were then immediately retarded and the aircraft taxied back to its alert position and "rechocked."

In this particular Coco exercise I had advanced power to 100%, checked for normal instrument readings, released brakes, and immediately upon start of take off roll retarded all throttles to idle, the standard operating procedure for a Coco exercise. Approximately 1/3 down the 12,000-foot runway, approximate speed fifteen-twenty knots, I suddenly felt an extremely hard "thump, thump, thump," as though the wheels had suddenly developed symmetrical flat areas, or the runway had suddenly become corrugated. Simultaneously the nose of the aircraft rose up and I felt erratic side-to-side vibration of the nose; on my left I saw a wheel rim careening away from the aircraft across the runway almost perpendicular to our heading; the copilot said, "We have a fire in the tail." I applied brakes and told the crew to get out. Perhaps the aircraft stopped itself without my braking, I don't know. I cut all engines and left the seat to exit.

When I had stepped down into the aisle I saw that the copilot was trying to open the entrance door. The navigator was beside him. It was obvious there was a problem with the door and I remember anxiously thinking that possible fuselage twisting might have jammed the door. It was clear to all three of us that we must exit that burning aircraft without delay. I stepped back up to my seat to lean over and unlatch the canopy to actuate the emergency canopy release to afford us an immediate exit. At the same time, the navigator returned to the nose to release his emergency escape hatch. As I turned to pull the canopy emergency release handle, I saw, with much relief, that the copilot had the entrance door open and had started his exit. I called the navigator and he exited right behind me.

As I hit the runway I saw that the tail was enveloped in towering flames that extended forward to the aft wheel well and laterally to each wing tip. Our now immediate concern was to get far enough away before the imminent conflagration when all [redacted] tanks would explode in fire. We were aware of a ten-minute "safe" period be[redacted]e the high explosive component of the bomb bay cargo could possibly detonate after becoming enveloped in fire. That possible high explosive detonation our training taught us was the worst that could occur. But what if our training

was not correct? We wanted to shield ourselves from what we imagined could become even a much worse happening than high explosive detonation.

We ran across the open field for about a mile till we reached a ravine where we lay low. While we ran we could hear and see the whistling, screaming ATO bottles as they were propelled into the air like July 4th rockets.

After laying low for about ten minutes we thought the worst was over, so we started walking back toward the inhabited area of the base, circling wide around the still burning aircraft. But then we saw the fire fighters suddenly proceed to evacuate the fire scene, indicating to us that the ten-minute "safe" time was up and the high explosive component of the bomb bay cargo could now detonate. So we turned back toward our "refuge," but then a jeep drove up and took us to an operations facility.

Because the destroyed aircraft had been armed and was strike-ready, the entire base had been evacuated before it became clear that the worst was over. I later learned that about 200 feet of the 12,000-foot runway had been burned away across its entire width.

Heads Up Flying Club

By Colonel Ron P. Berniscone, USAF (Ret)

The "Heads Up Flying Club" was a regular feature in the Combat Crew Magazine published by SAC. I was featured in May 1961 as the recipient of the award for the following actions: I was copilot on a B-47 that was flying a night training mission which included a refueling, some bomb runs and a grid navigation mission. The other crewmembers on board were the Aircraft Commander, the Navigator-Bombardier and in the crawl way a maintenance man getting his flying time for pay. The first thing after takeoff was a rendezvous with a KC-135 tanker. Part of the before refueling checklist was to have the A/C turn off the slipway anti-ice system. The A/C instead turned off the master air conditioning switch. The cabin pressure slowly rose to 27,000 feet. The A/C did not have his mask on so when he approached the tanker for hookup he had difficulty getting into position with the onset of hypoxia. I knew we were in trouble when the B-47 climbed a little and then started a dive right for the tanker. When the A/C did not respond to my call I pushed forward hard on the stick and we dove under the tanker. The poor Navigator could not see out and all he knew was we were headed down for the Grand Titon Mountains in a steep dive at design limit airspeed.

He asked for permission to eject but I knew the man in the crawlway could not get out, the A/C could not get out and the N/B's downward ejection would be hazardous under those conditions, so I asked him to stay with me just for a little while. I had been taught in training that in a high-speed condition the best thing to do was drop the gear even if it tore the doors off. So I pulled the power completely off, dropped the gear and pulled the nose up through the horizon. With the aircraft stable I had the maintenance man put the A/C's oxygen mask on and he recovered quickly. Being an ex-fighter pilot, he then requested the tanker to allow us to come back and get our off load. He was denied permission in the strongest possible terms. As we climbed out of the aircraft after returning to base, my N/B, a huge bear of a guy kissed me on the top of my head and said thanks. That always meant more to me than any other recognition I got from the Air Force.

Hot Wiring a B-47

By Lt. C. O. Smith, USAF (Ret)

I suppose that all of us who flew as B-47 crewmembers have our memorable experiences. I flew as a Bomb-Nav on B-47's with the 310th Bomb Wing, 380th Bomb Squadron out of Smoky Hill AFB (later Schilling) in the mid-1950s.

To set the stage, for those of you who never flew out of Smokey Hill AFB, the runway ran roughly north /south. From the northern end of the runway the ground rose gently towards the north into a 300 or 400-foot hill, so that an approach on runway 18 was a slight down hill run following the contour of the hill. (I believe that later this hill was lowered).

On my 28th birthday (11/08/54) we had just completed a relatively routine (sunline, two RBSs, refueling, etc. mission) except that my A/C was undergoing a check ride and we were carrying an Instructor Pilot as copilot.

As we readied for landing, the IP indicated that he would take control of the aircraft and make a rear seat landing on runway 18 (a north to south landing). Darkness was approaching as it was early November and the time was about 1830 local. As the navigator, I was completing my landing checklist, gathering up my navigation kit and preparing for an uneventful landing when I heard the IP say "S..." and I felt the engines "spooling up" and the aircraft accelerating. Then there was a loud scraping noise under the N/B compartment, a sudden, instantaneous, momentary deceleration (similar to an arrested landing on an aircraft carrier – I've done that too – except that it was only for an instant). We continued what seemed like a normal "go around" and the aircraft seemed to be responding normally. The

A/C commander made a front seat landing; we followed the "Follow Me" jeep to the landing area, and disembarked the aircraft. We discovered (with our flashlights for it was about 1900 local) that there was a long 2 inch diameter wire wrapped around the forward main gear and that the wire trailed off along the right back of the aircraft for as far as we could see in the dark.

We then proceeded to debriefing, and were all queried about what we had heard or seen. The A/C and the IP were then invited in for a special debrief. As a navigator buried in the "hole" of a B-47E, I could not see or hear much so I was allowed to proceed to the belated birthday party that my fiancée had waiting for me.

Apparently what happened was we hit the main power line feeding several smaller communities west of Salina and brought some of it home with us. We were fortunate in several respects:

- We were making a drag chute assisted landing; therefore, the engines were at 60% instead of the 50% used when making a no drag chute landing. (Those J47's had a God awful "spool up" time from 50%).

- The IP realized that we were low and had initiated a "go around " and we were accelerating prior to hitting the power line. As I remember it, the B-47 landed about five knots above stall speed so that any deceleration may have been disastrous at that point in the landing cycle.

- We did not hit the line straight on. Apparently we caught it with the chin of the aircraft and it scraped along the bottom across the radome and became lodged in the forward landing gear doors. On the left side the wire broke short and wrapped around the forward main. On the right side approximately 400 feet of wire was trailing behind the aircraft and it fouled neither the brake chute nor the drag chute. Had we hit it head on, the wire may well have sliced into the N/B compartment and caused severe damage to the aircraft and me.

I do not remember or never knew what action, if any was taken against the IP. Evidently the damage to the aircraft was minimal because that is the aircraft in which I flew my final B-47 flight/mission (a/c #52-101) on 5 August 1955 before leaving the USAF. My future father-in-law, MSGT J. J. Bush, was the 380th Line Chief at the time, and he supplied me with most of my information. He also showed me the coil of wire that had been removed from the aircraft.

Routine?

By Captain Neil A. Ludvigson, USAF (Ret)

Reflex was a routine part of the life of many B-47 crewmembers in the late 1950s and early 1960s. "Reflex" meant anywhere from two weeks to a month of overseas duty away from your family.

Our reflex this time was from Whiteman AFB in Knobnoster, MO, to Fairford AFB in England.

On the runway, number three in a three-ship formation; it was just turning from daylight into darkness. We had said good-bye to our families once again as we did at least every three months. All was routine, the flight planning, walk-around and pre-flight.

Now it was time to go. The lead crew was getting the final clearance when I looked down and something I had never seen before in over 1,300 hours in the B-47 happened. The left alternator light was on. I tried a bulb test and a circuit breaker reset.... Nothing, it just would not go out. Everything else in the aircraft was normal. The left alternator was definitely out.

I asked the nav if he had any abnormal indications of electrical problems. No, nothing.

The A/C heard me and asked if anything was wrong. I advised him of the problem and we had a brief discussion. By that time, number one was rolling. We had to make a decision. It was to go, since the tech manual assured us of the system redundancy of using just one alternator for our aircraft power needs and who ever heard of a B-47 loosing both alternators? What a mistake? Now it was not quite routine.

Weather had reported severe thunderstorms in the St. Louis area, one of our bomb-plot targets enroute. Just routine. We could get above the storms well before St. Louis even after picking up our unusually heavy refueling load on the way to St. Louis.

The refueling this time was behind a rather slow flying KC-97 and was routine except for the off-load which was unusually heavy due to our anticipated over water flight. We had to get our fuel in a hurry and start our climb-out quickly to our bomb run altitude in order to get above the heavy weather in the St. Louis area. So far, no sweat on the alternator problem.

The practice bomb run on St. Louis bomb plot was routine. Normal ECM routines at fifty miles, a routine bomb run and a near "shack." By now all of this was routine due to the hundreds of runs just like this. We went through our after run checklist and settled into our second cigarette on our way to Boston bomb plot, our second run.

Someone once said that flying is hours and hours of boredom punctuated by moments of stark terror.

Just after we were passed from St. Louis center to Boston Center and were switched to Boston bomb plot frequency, it happened. I had just asked the A/C to crank up the heat 'cause it was getting cold back there at our new altitude. This was to prove to be a very bad suggestion.

With no warnings, wham, the second alternator light hit me right in the eye. It was probably one of the brightest red lights I will ever see in my life. All hell broke loose! We immediately lost all of the nav equipment, all of the aircraft powered flight instruments (most), all fuel transfer capability, and I was to soon learn, the aircraft heat controls.

After a minute or two to assess the situation, we received permission from Boston bomb plot to abort our run, contact Boston center and declare an emergency. We had UHF and that was about all. We let our leader know we were aborting and declaring an emergency and would be contacting Boston Center for air traffic instructions. Would they please contact SAC Headquarters as well and let them know we were aborting. They would call Whiteman.

In the mean time, I was starting to sweat! Not from the emergency, but from the aircraft heat which the A/C had turned up considerably, at my request.

Boston center advised us that they would clear our altitude and route to the nearest Air Force facility that could handle the B-47. We should just go off frequency and get what help we required. They said their usual "Good Day, sir" and we left their frequency to contact an Air Force facility enroute. First however, we asked center for weather in the northeastern U. S.

Center advised us that, "Everything in the eastern U.S. was socked in." Hey, what happened to routine? Our best bet was Goose Bay Labrador. O.K., without nav equipment, which way was Goose Bay. Pease AFB, NH was barely audible on our UHF, but they gave us a heading and we set our course after confirming the weather with Pease. They were below minimums.

Now we will get a chance to see if our training was worth anything. We were pretty good with celestial navigation under routine conditions, but now we had to make it practical and use it to find our way to Goose Bay. Just one little problem, now it was so hot in the aircraft that my harness buckles were too hot to touch. Thank God for flight gloves.

I cracked out the sextant and went to work with the nav to shoot celestial for Goose Bay. It worked, but I paid for it in sweat. I was soaked to the gills. Dripping wet. My flight suit was soaked in sweat. I have no idea how hot it was, but I have NEVER been so hot in my life, and I live in Las Vegas where summer temperatures can get to 120 degrees.

Pease passed us off to Goose Bay via landline and we eventually picked up Goose Bay approach control. With our nav aids and most instruments out, we were still in trouble, especially since our tip tank transfer went bye-bye when our second alternator went out. We could not transfer ANY fuel out of our near-full tips. The manual says you don't land with full tip tanks.

We talked that over with Goose Bay. They advised us of a point in the arctic where we could drop our tanks, but accurately getting there and back might be a problem with only a UHF radio and a sextant, in the dark over the Arctic. Also, we started to think about things like, what if only one tank released? We would be over the desolate Arctic area, at a very low altitude, and would we be able to fly and control the aircraft with the weight of one tip tank full of fuel vying for control? Hey, again, what happened to routine? This was NOT routine, and don't forget, by now we were all sweating like hell!

As if things were not now complicated enough, Goose bay advised us that they were still below minimums, less than 250 feet ceiling and visibility at less than 1/4th mile. We were starting to earn our flight pay.

We agreed that the dropping of tip tanks at low level somewhere out on the ice in the Arctic was not a real good option. We'd rather take our chances with the B-47 holding together in a landing with the tips still on even if they were still full of fuel. At least we would have some help if anything happened. Besides, even though Hell might be cooler than we were at the present time, crashing and/or freezing in the remote Arctic didn't appeal to us either. I know that even if we survived an uncontrolled crash, I would have been an instant ice cycle anyway, 'cause by now I was totally drenched.

We were passed to Goose Bay GCA. What? GCA? By this time, GCA was just for emergencies only. We had practiced them early in our training, but this was NOT routine. Well here we go again. Our past training better work as a go-around would not be routine with the heavy tip tanks, the gear and flaps down and the drag shoot deployed. Oh, brother!

Thank God, the A/C made one of the best landings he had made to date. We rolled, and rolled on the ice-laden runway. With the heavy tip tanks and a pretty good remaining fuel load, we got her stopped with about 500 yards to go and taxied in. There was no damage to our aircraft and the crew was just a few pounds lighter from sweat loss; however, we were all a few years older from the "routine" evening.

Three hours later (SAC rules), we were off for England and a thirty day alert stint. I smoked my last cigarette on the climb-out and quit. This had to be an omen.

Three Today in Tampa Bay

By Colonel William W. Simmons, USAF (Ret.)

There was a period in the early history of MacDill AFB, Tampa, Florida, that the phrase, "One a day in Tampa Bay" was coined as a result of the large number of aircraft flying out of MacDill that crashed in the bay. However, this period of time was well before the following incident that occurred on September 26, 1960 which a reporter for the Tampa Tribune stated in part that, "the chain of events would rival the hottest chapter in the Perils of Pauline."

Our combat crew was assigned to the 306th Strategic Bomb Wing at MacDill AFB. The crew consisted of 1st Lt's. Roland W. Korte (age thirty), Aircraft Commander William W. Simmons (age twenty-five), Copilot, and Harry A. Sheffield (age twenty-nine, Radar Navigator. All of Lt. Korte's prior experience had been in fighter aircraft. Lt. Simmons had two years prior experience as a navigator in a transport aircraft, returning to pilot training and upon graduation in 1960 was assigned to B-47 Combat Crew training at McConnell AFB, Wichita, Kansas. Lt's. Simmons and Sheffield completed Combat Crew Training on the same crew and were assigned to Lt. Korte's crew upon arrival at MacDill AFB in the summer of 1960.

On September 26th, 1960 our crew was scheduled for a routine training mission with a 6:40 pm take-off time. We also had a fourth man scheduled to flying the crawl way seat. Upon completion of the exterior preflight, we boarded the aircraft. Just prior to engine start, we were advised that the fourth man would not accompany us and he was told to deplane. After his exit, we proceeded with engine start, taxied to the active runway and were cleared for take-off. Weather conditions were excellent. It was clear with very light wind. Take-off and initial climb was normal. As we were passing through 1,800-feet, we heard an explosion, looked to our left and saw flames around the area of the left outboard engine. The aircraft immediately started a roll to the right. We were unable to override the roll with full opposite controls and Lt. Korte gave the order to bailout. (The accident investigation determined that the aft engine mount pin on the number 1 engine had failed allowing it to fall down while still producing power and catapult the aircraft into an extreme right roll.) By this time, the aircraft was rolling through ninety degrees. Lt. Sheffield and I initiated the ejection sequence and separated from the aircraft as it was rolling through approximately 120 degrees. Lt. Korte had delayed his ejection until we ejected. By this time, the aircraft had rolled 180 degrees and was upside down. Lt. Korte delayed his ejection until the aircraft rolled approximately another ninety degrees to allow him to eject horizontally instead of straight down.

Upon hearing the order to bailout, I immediately initiated the ejection sequence. I remember the canopy blowing, the seat bottoming and the tremendous force of the wind that hit my body as the ejection seat departed the aircraft. I momentarily "blacked-out" and don't remember losing my helmet. I vaguely remember separating from the ejection seat. The next thing I remember was looking up at my deployed parachute and then looking down at the water below. I said several "thank you God" and deployed my dinghy. After a few seconds, I disconnected my chest harness strap but didn't inflate my life vest or release the guards on the parachute quick releases on my harness (contrary to our survival training procedures). I remember thinking that there was no way I was going to touch the quick release guards until my dinghy hits the water. Shortly thereafter my dinghy hit the water, I pulled the guards down, my feet hit the water, and I depressed the parachute quick releases. I entered the water at a slightly higher speed and descended to a lower depth than one experiences when jumping off a high dive board. I deployed my life vest and when I popped to the surface my dinghy was within arms reach. I had often wondered if I would have a problem getting into my dinghy if I ever had an occasion to use it. There was no problem!! I grabbed the sides and propelled myself in it on the first shot. In fact, I almost jumped over it!! I rolled over on my back, said several more "thank you God", and disconnected the dinghy strap attached to my harness. I'm now safe in my dinghy and the sharks can't get me. All I have to do now is wait for someone to come get me.

Shortly thereafter I hear a helicopter approaching. It hovers above me and I see a basket being lowered. The basket is maneuvered to the side of my dinghy; I grab it and roll out of my dinghy into it. I become airborne again as it is raised to the door of the helicopter and the Coast Guard crewman operating the hoist helps me into the helicopter. I take a seat in the rear facing forward toward the door. The helicopter moves a short distance and hovers again. I see the basket being lowered. When it is raised to the door, Lt. Sheffield is helped into the helicopter and joins me in the rear facing aft. We both still have on our life vests and are congratulating ourselves on our good fortune as the helicopter moves another short distance and goes into the hover mode again. I see the basket being lowered and in a few seconds the helicopter starts forward without the basket being raised. (We didn't know at the time that the helicopter was losing power and the pilot pushed the controls forward to avoid descending on Lt. Korte.) I saw water approaching the door and suddenly realize we are descending into the bay. All of a sudden the water is at door level and the Coast Guard crewman in the door yells, "Let's go!!" and jumps out into the water. The helicopter continues to settle into the water and starts rolling to the right (this is apparently the night for right rolls!). I race to the door and exit, as the door is about half submerged with water rushing in, I think, "oh my

God, the helicopter is sinking, my life vest is going to pop me to the surface of the water and the rotor blades are going to cut my head off and kill me." I stay under the body of the helicopter to prevent being popped to the surface until I run out of breath. I pop up and the blades have stopped rotating. About this time, Lt. Sheffield surfaces next to the helicopter without his life vest flailing his arms and screaming, "I can't swim! I can't swim!" By the time he had gotten to the helicopter door to exit, it had rolled so much that every time he attempted to get out the incoming water would push him back in. In order to exit, he had to take off his life vest and go under water to get out the door opening. I swam over and grabbed him. The helicopter remained partially afloat with the three helicopter crewmen sitting on top of the cockpit area. Lt. Korte swam up and he, Lt. Sheffield and I hung on to the body of the helicopter. I start thinking about sharks again. I had left the safety of my dinghy for the helicopter to be rescued. Now it's dark, I'm back in the water without my dinghy, needing to be rescued again, dangling and waiting to be eaten. It just isn't my night!

Pretty soon we hear an outboard motor and one of the helicopter crewmen fires a flare. We start yelling and the boat reaches us. It's a fifteen-foot boat with a father and his teen-age son. The teen-age son had been outside their house (which was near the location that our B-47 and the helicopter crashed), saw the B-47 and the parachutes, ran in and told his father that there was a plane crashing in the bay. They went outside, hooked the boat and trailer to his father's car, drove to the bay, launched the boat, and subsequently found us. We six crewmembers got in the boat with the father and son and headed toward shore approximately two miles away. I think, "Safe at Last! Safe at Last! Thank God I'm Safe at Last!" The sharks can't get me and I don't' have to worry about this thing falling out of the sky! (It's funny how your mind works in situations such as this. In all my experience flying over water, the worst fear I had was that I would wind up in the water and be attacked by schools of sharks. There probably was not a shark within ten miles of me in my various locations in the bay that night.) With eight of us in the small boat, it was overloaded and running very deep in the water. We traveled about 30 yards and ran aground. (When the helicopter crashed, we didn't realize that we were on the western edge of the ship channel and the water was only about chest deep once you got out of the channel.) We six crewmembers jumped out of the boat, pushed it off the mud flat and walked along side until we came to an area of the flats that had more depth. We got back in the boat and continued slowly to shore where we were met by a crowd of on-lookers.

Meanwhile, someone had called MacDill, gave them our location and about forty-five minutes later an Air Force ambulance picked us up and transported us to the hospital. The flight surgeon checked us, found no injuries, and kept us over-

night for observation. (It was subsequently determined that Lt. Korte had torn some tendons in his shoulder during the ejection sequence and they were surgically repaired.)

Now that I'm in the hospital and don't have to worry about sharks anymore, I began to worry that I might have been castrated when the parachute deployed. I remembered being told during survival equipment training that if your parachute harness leg straps were too loose when the parachute deployed it could castrate you (in retrospect, I think this was an extreme example used to impress upon us the necessity of having the harness snugly adjusted.) I couldn't remember how tight mine were prior to take-off but I'm happy to report, "They were tight enough.

We learned the next day that when our helicopter went down the Coast Guard had immediately launched a second helicopter that had also lost power and crashed in the vicinity. All four of its crewmembers were also rescued with no injuries. We heard that both helicopters had launched immediately after engine start without allowing the engines to sufficiently warm up. As a result of the weather conditions (high humidity and calm wind) and hovering close to the water surface of the bay, the engines developed carburetor ice, lost power and went in.

We continued to fly as a crew until 1963 when we were assigned to B-52 crew training enroute to our assignment to the 462d Bomb Wing at Larson AFB, Moses Lake, Washington.

We were extremely lucky that night, but he luckiest person alive was our fourth man that had deplaned just prior to engine start. Without an ejection seat, I'm convinced there is no way he could have egressed the aircraft and survived prior to its impact in the bay.

The Straight Poop

By Lt. Colonel Hal K. Bowman, USAF (Ret)

There is an incomplete aircraft accident investigation report somewhere in the dusty files of the now-defunct Strategic Air Command. SAC didn't tolerate unanswered questions. So to help put the Command's soul at rest after thirty-five years, here is the straight poop.

The accident involved a failed hydraulic system that caused a B-47 to take a right angle turn and skid off the runway during landing. The damage was relatively minor, limited to the front landing gear and the wing commander's safety record. The B-47 had several design quirks, like the wings that were supposed to carry six jet engines and still flex fourteen feet at the tip to absorb turbulence, but

the landing gear was typically Boeing – strong as an ox. The gear consisted of tandem trucks with outriggers on each inboard engine nacelle. The forward main gear was hydraulically steered by the rudder pedals and could swivel 60 degrees in each direction for taxiing. The accident in question involved in-flight failure of this system. A hydraulic line rupture emptied the system and allowed the front gear, with the help of the slipstream, to rotate to the full left position. There was no indication in the cockpit prior to landing that the front wheels were aimed 60 degrees off the runway centerline.

The landing with the wayward front gear took place at about 3 AM on a very cold Lincoln, Nebraska morning. We were landing on 35, a 12,900-foot runway, which is still in use at LNK. The parallel ramp on the west side was full of airplanes. In 1963 Lincoln AFB was the home base of two bomb wings of B-47s and a squadron of KC-97 tankers. It was a busy place with a hundred large aircraft on the ramp. A plane inadvertently leaving the west side of the runway had about a hundred yards of clearance before running onto the ramp. On the east side there was an open field where the commercial terminal and general aviation area are now located.

A successful B-47 landing consisted of an approach a few knots above stall with the standard rotation over the approach lights. If the speed and weight had been correctly matched, the rear truck would contact about the time the thing quit flying. Touchdown was the signal to deploy the brake chute, which would drop the front gear a few feet and straighten out any crosswind correction. Landing the B-47 was not an exercise in finesse. It was mechanical, rough and efficient. The procedure had been developed to avoid the dreaded porpoise that could make the plane uncontrollable when the front truck made contact first, then pitched the bomber back into the air with minimal control speed. In training we were shown memorable films of unsuccessful porpoise landings that ended with the plane rolling onto the stalled wing. The oft-used compromise landing technique was to chop power, rotate the nose up when over the end of the runway, and then pull the brake chute. If the pilot's depth perception was working and the plane was within ten or twelve feet of the concrete, the result was acceptable. Any higher and the tower would see telltale smoke from the tires when they hit the runway. The drop-her-in-from-ten-feet technique was frequently used at night under cover of darkness or by faint hearted instructor pilots required to show landing proficiency from the back seat.

Our approach was normal until touchdown, but with the front gear at a sixty degree angle the plane pitched up violently at first contact, followed by a series of lesser bounces as the brake chute took effect. The nose finally settled and momentum carried the plane straight down the runway skidding on the two front tires.

The great mystery developed when, as the bomber slowed through 100 knots, it veered off the right side of the runway, safely into the open field opposite the direction the front gear was aimed. It skidded over frozen ground and six inches of snow and came to rest, bent but not broke, about a hundred yards east of the runway. The fuselage had an ominous wrinkle where the front gear hooked onto the bulkhead. The landing gear strut was bent back about ten degrees. The two tires were still inflated, but ground down well into the steel cord.

The subsequent accident investigation identified a ruptured hydraulic line as the culprit but the reason for the turn opposite the heading of the cocked front gear was never solved. Fortunately the accident board in their infinite wisdom failed to ask me, the aircraft commander, if I had any explanation for this fortuitous phenomenon. My momma didn't raise fools so I kept my mouth shut.

The broken hydraulic line and failed steering system were not crew error. The B-47 procedures prior to the accident were found to be at fault. The airplane was very slick and difficult to slow down in a descent. In a clean configuration with the nose down it would rapidly pick up speed. The flexible wings caused aileron reversal at something over 425 knots. As the plane approached that speed aileron deflection twisted the wings and canceled out the aileron effect. There was no aileron control during this transition speed. At higher speeds the wing would twist more and the controls would go into aileron reversal. Turn the wheel to the left and bank right – which gave the pilot a lot to think about in an inadvertent high-speed situation. To solve the descent speed problem the main gear could be dropped at altitude, which would allow a steep descent at reasonable airspeed. A checklist item at 10,000 feet included alternately pushing the rudder pedals, which would test the hydraulic steering system by moving the extended front truck left and right. A deflection on the hydraulic pressure gage indicated the system was operating. I had a habit of giving the rudder pedals a good punch, which would slam the nose back and forth. This would get the attention of our navigator, Sam Trabun, who never was particularly fond of his windowless, claustrophobic crew station in the nose, perched on a downward ejection seat. On our flight the system was cold soaked after being at altitude for several hours and the steering check with cold fluid ruptured a defective line. The fluid was lost after giving a positive check and the forward gear came to rest at a 60-degree left steering angle. After the accident B-47 crews were advised to gently test the steering in one direction to avoid stressing the system during the descent check.

I may have been only marginally responsible for the broken hydraulics, but must I take full credit for pilot error that caused the unexpected right turn off the runway. Our three-man crew flew six to eight hour training missions in the B-47, mostly at night to avoid loading up daytime domestic air traffic. A typical mission

included air refueling, a low-level navigation/bombing exercise, radar bomb runs on various cities around the country and then the long, boring celestial navigation leg. The copilot and navigator did all the work on the celestial leg. The aircraft commander's celestial nav responsibilities included monitoring the autopilot, sightseeing (the view was spectacular from the front seat under the bubble canopy) and eating a flight lunch. I usually enhanced the lunch break by replacing the ejection seat safety pin and unstrapping the parachute and seat harness. The break from the confinement was always welcome and it was also the only way mere mortals could reach the relief tube. On the night the steering system failed I forgot to strap back in the Weber ejection seat and landed with no more security than a cup of coffee on a dashboard.

When the plane dropped on the canted forward landing gear the friction caused the nose to bounce four or five times before it settled into a skid down the centerline of the runway. During this wild ride I was pitched up against the canopy and all around the cockpit. In the process of all this flailing about, the sleeve of my flying suit hooked the number one throttle and moved it from idle to 100%. As the airplane slowed, the asymmetrical thrust from the left outboard engine overpowered the left-aimed steering gear and the bomber departed runway 35 heading east. The ground was frozen hard and with the snow the 130,000-pound plane slid like a toboggan. During this ride I reached over to put the six throttles in idle cutoff and was surprised to find number one straight up and the engine pushing us in a gentle right turn.

The plane finally came to rest with the front tires smoking from friction heat, which encouraged the three of us to make a rapid exit. It was a pitch-dark night and the tower didn't miss us for several minutes. We waved flashlights to attract attention and the fire trucks soon appeared followed shortly by the wing commander (Col. Wiseman, I think) looking cool in his flight jacket and pajamas. He commented on our good fortune in avoiding harm's way. I acknowledged modestly. It was my only landing in forty years of flying done without benefit of a seat belt and shoulder harness.

The Final Flight of RB-47 #43290; A Crow's Reflections

By Major George V. Back, USAF (Ret)

Someone once said that it was better to be on the ground wishing that you were in the air rather than being in the air wishing you were on the ground. There is some wisdom in that statement. I know because, as the "Crow-2" on crew E-96,

we came face to face with the "Cold War" on the 28th of April 1965. Most of the events of the attempted shoot down have been well documented but I will try to let you know what some of my personal thoughts were during those tense moments.

Joel Lutkenhouse, the "Crow-3" on the crew, and I were in the same Undergraduate Navigator training class at Harlingen AFB, Texas, and upon graduation, were assigned to the 376th Bombardment Wing at Lockbourne AFB, Ohio. When the Wing was deactivated we both went PCS to the 55th Strategic Reconnaissance Wing at Forbes AFB, Topeka Kansas in the spring of 1964. After flight training and checkout in the RB-47, we were assigned to crew E-96, Lt. Col. Hobart Mattison's crew. Capt. Red Winters was the Raven-1 and Capt. Bob Rogers was the Navigator. Lt. Hank Dubuy, also a new guy, was the copilot. Matt, Red, and Bob were experienced, professional and outstanding crewmembers. Their strength is probably why Hank, Joel, and I were put on the crew. The 55th, for many years was considered a "Closed Union" and we were the first "Brown Bars" to be assigned to the unit in many years. Most of the crewmembers were Lt. Colonels, Majors or Sr. Captains. Matt was no-nonsense when it came to flying and demanded the highest standards of professionalism.

Our crew was known as "Mattison's Drill Team" because, before every mission, we lined up under the wing for inspection with our parachutes on the ground in front of us, our helmets on top of the "chutes." Matt would conduct a pre-mission crew brief to make sure we all were aware of any particular operations, which pertained to that specific mission. We would do a left face, march forward till clear of the parachutes and begin our individual pre-flights. When talking on the interphone, we addressed each other by aircraft position, said what needed to be said and shut up. First names, jokes, and bullshit were for outside the aircraft, the O-club, and "Mama Kay's." I cut my Recon teeth in the 55th with crew E-96 and firmly believe that I am here today only due to the grace of God, crew integrity and the ability of Matt to fly, and plant firmly on the runway at Yokota, an otherwise unflyable pile of smoking aluminum scrap.

No matter how much preparation I had, how much intelligence on the "Bad Guys" I knew, and how little reconnaissance experience I had, I never thought that some North Korean son of a bitch would try to kill my ass on my first operational TDY. The Soviets and their satellite countries were somewhat predictable in their response to the "Par-Pro" reconnaissance sorties flown by the 55th. But don't ask John McKone or Bruce Olmstead to verify this. An unwritten rule of Cold War aerial reconnaissance was that a turn about is fair play. The U.S. didn't harass Soviet reconnaissance aircraft patrolling U.S. borders (too much) and we expected similar responses to our flights from them. You want to surprise and intimidate the other guy, but again not too much because he is going to catch you in his "back-

yard" someday and do the same to you. The North Koreans always were, and still are, a bunch of unpredictable crazy bastards and their actions, most times, irrational. After this mission I knew this for a fact.

Sitting in an ejection seat, facing aft, with no window to see the horizon for a frame of reference can make for pretty scary flying, at times, especially during refueling if the pilot got into a "Dutch Roll"- no matter how small. I often thought how lucky I was that I didn't get vertigo very easily. When we were hit by the first rounds of cannon fire from that North Korean MiG-17, it made for a very sporty ride indeed. I wasn't monitoring the interphone and felt the aircraft go hard nose down and shudder. My very first thought was that the autopilot or trim failed but a split second later, as I went to the normal interphone position on the wafer switch, I found out that a couple of MiG-17s were very serious about shooting us down.

In an instant, my mind seemed to go in a thousand different directions at a thousand different speeds. You know that the aerial reconnaissance business is a "cat and mouse game" but you don't expect to get your ass blasted by some fucking North Korean on your first TDY while eighty miles out over the sea in international waters. This was the first time in my life that I thought I was really going to die and the irony of it was that I had no control over what was happening. Panic and fear paralyzed my thought process for a split second and I sat dumfounded for what seemed an eternity trying to figure out what the hell was going on and what to do. When Matt remarked that we were hit and going down I thought that this was the end and started the ejection sequence. The "Dash-1" (flight manual) for the aircraft has a red-bordered page section, which contains "Emergency Procedures." Certain procedures in this section are known as **BOLD PRINT ITEMS**. These are to be committed to memory and are the minimum steps of procedures that must be followed in order to insure survival. I instinctively initiated the bail-out sequence by depressurizing the compartment and arming my seat for ejection. My mind was still racing and everything that I ever did or witnessed seemed to go whirling by in a kaleidoscope of my life. But at the same time a different part on my brain seemed to be saying don't panic, you have been trained for situations like this, do your job and follow the checklist. That is when I collected my thoughts and realized that the aircraft was still well above 14,000 ft. and that my chance of survival in the fifty degree water was less than thirty minutes. In reality this all must have happened in a few microseconds. As fast as the panic came, it went and I felt an uneasy calm. I was still scared shitless but now started to think rationally, get your oxygen mask on, check the flow, tighten your parachute harness-remember, you're sitting on an armed seat, watch out for the "D" ring.

During the subsequent MiG passes, I could feel the cannon fire impact the aircraft and remember thinking that any time there would be a tremendous explo-

sion, rush of cold air and that would be all that I would remember. To my great relief, that never happened. During the subsequent passes Hank thought he may have got one of the MiGs and as it rolled nose down and continued straight down through 12,000 ft. the other fighter broke off the attack and departed. I felt a sigh of relief but realized that we had more problems ahead, trying to get back to Yokota and on the ground in one piece.

"Old 290" was severely damaged but miraculously continued to fly. Three engines were shut down, we had no hydraulics, the aft main fuel tank was ruptured and burning, the aircraft was vibrating badly, and flying in a severe nose down attitude, but we were nevertheless flying. That RB took a lot of punishment. When Matt told Hank to get the "Dash-1" out and go to the red-bordered pages, Hank asked "which page," to which Matt replied, "just about any page will do". Upon our arrival at Yokota, Matt briefed us all on how bad the landing could be and inquired if anyone wanted to bail out over the runway, there was a unanimous "No Sir". By now all fear had left me and I had the utmost confidence in Matt and somehow knew that God didn't get us this far just so we could end up splattered all over the runway. The landing (it was more like a controlled crash) was just as rough as Matt had predicted. We caught the nose wheel and porpoised violently nearly colliding with the fire suppression helicopter which was right above us. I thought the fuselage was going to break right behind the copilot but it held together. Matt fought to keep the wings level and Hank pulled the brake-chute after the third rough bounce and "stood on the brakes". The aircraft stopped on the runway and we all got out unscathed. Red said to me as we were waiting along the runway, "Remember George, we are now living on borrowed time."

Final Flight Of An Operational B-47

By Colonel Richard L. Purdum, USAF (Ret)

On the 24th of October 1969, Don "Tiny" Malm and I traveled into Tulsa, OK to pick up the last operational B-47 and to fly it to the "bone yard" (Military Aircraft Storage and Disposition Center) at Davis Monthan AFB, AZ. The tail number was 512362 and it was a WB-47E model aircraft. Between Tiny and me, our experience in the B-47 consisted of over 10,000 hours of flying time and spanned a period of twenty-five years. We were both assigned to the 9th Weather Reconnaissance Wing at McClellan AFB, CA at the time of this flight. Both of us had been previously assigned to bombardment wings flying the B-47 prior to flying the WB-47E in Air Weather Service.

The aircraft had just completed PDM at the Douglas plant at Tulsa, OK. It was rather ironic that this aircraft had just been inspected to bring it right up to the latest specs to be flown safely and operationally for a long time, and here we were taking it to be chopped up for scrap. As a sidelight both the B-58s (the worlds first supersonic bomber) and the last flying B-47s (all WB-47s flown by Air Weather Service under Military Airlift Command) were ordered to stand down and be flown to museums or the bone yard for scrap. This was ordered by Air Force Project 702. I believe this was part of then-Secretary of Defense McNamara's grand scheme to draw down what he considered unnecessary aircraft for the United States Air Force.

Tiny and I flew commercially into Tulsa to pick up the aircraft. Neither of us had any sense of the significance of this last flight as the long line of B-47s that had preceded this weather reconnaissance aircraft. There were 2,040 B-47s built and they were the bulwark aircraft of the Strategic Air Command, and were extremely instrumental in winning the Cold War. We did not take any pictures and there was not any press coverage concerning this last B-47 flight. Sort of a sad commentary on such an important flying machine. Because it had done such a terrific job of deterrence, the B-47 had never had to drop any bombs against an enemy.

After we completed the preflight we fired up the six General Electric J-47 engines and took off for Davis Monthan AFB. I was in the front seat and Tiny in the back. We did not have a navigator as we flew airways to Davis Monthan AFB. The 2.4-hour flight was uneventful and it was a beautiful day for flying. The weather conditions at Davis Monthan were CAVU. I asked the control tower for permission to do a high speed 360 overhead approach for landing, which was granted. Normally, we would make an enroute straight in approach for a landing, but I wanted this last one for the B-47 to be a little special. I descended down to pattern altitude and accelerated to 425 knots indicated for the approach. This was the airspeed we used to fly the low-level bomb runs, which is 45 knots faster than the B-52s fly their low level bomb runs. Some of the readers might not be aware that when the WB-47Es were modified for the weather reconnaissance mission, the wing tanks were removed, which made for a much cleaner and better flying aircraft. The max gross weight was also reduced from a high in SAC of 221,000 pounds to 167,000 pounds in MAC, which also made for a much more responsive and better flying aircraft as well. Over the end of the runway I pulled the six throttles back to idle in order to slow the aircraft down for landing and started a left turn to downwind leg.

About this time I thought of the old airman's adage – "there are bold pilots and there are old pilots, but there are no old bold pilots". I also asked myself:

"What am I doing flying at this airspeed? This aircraft is over eighteen years old and has probably not gone this fast this close to the ground for many years." It was also at this time that I remembered that the B-47 does not turn very rapidly at 426 knots indicated airspeed (aileron reversal is encountered at 456 IAS). It seemed as though we were going to over fly northern Mexico on this turn, but I was able to get the old bird slowed enough to get the gear and flaps down and complete the turn to the downwind leg and final.

Tiny said, "Make it a good landing since this will be my last chance to ever land a B-47". A smooth touchdown was made, Tiny deployed the brake chute and one of the final flights of an operational B-47 in the United States Air Force came to an uneventful end.

The Last Active Flight

By Lt. Colonel Raymond Hamilton, USAF (Ret)

After 14 years of flying the B-47E, it was an honor to be selected to participate in the last active flight.

On 29 October 1969, along with Squadron Commander, Lt. Colonel William Payton, I departed Hickam AFB, Hawaii with our last aircraft, WB-47E 517066 enroute to McClellan AFB, California.

Upon arriving at McClellan AFB, the tower called and asked us to make a low pass, gear up, over the ramp area for the television photographers to get some pictures. After making the pass and seeing all the personnel scattering, we realized our pass was a bit too low. We expected to hear about it upon landing, but nothing was said.

A ceremony was held on the ramp for the last aircraft and we entered crew rest anticipating the last flight scheduled the next day.

On October 30th, we departed McClellan AFB enroute to the Boeing aircraft plant at Renton, Washington. Upon arriving we were met by Boeing representatives and television personnel. A very nice ceremony was held at which time we turned over the aircraft to Boeing. Subsequently the aircraft was towed out to the Boeing Museum where it remains today.

The Final Flight of the Last Operational B-47

By Lt. Colonel Dave L. Hall, USAF (Ret)

From 1964 to 1977 the McDonnell Douglas Corporation, Tulsa, Oklahoma, maintained and operated two EB-47E aircraft under U.S. Navy contract. These two aircraft, # 52410 and 52412 had originally been Blue Cradle aircraft, operating out of Lockbourne AFB, Ohio. After extensive modification, these two aircraft were basically utilized to provide R & D services and training, primarily for the Navy.

In the mid-1970s it became increasingly more difficult to obtain parts for B-47 aircraft. In addition, airframe fatigue was becoming a major concern. Both of these aircraft had already exceeded the projected flight hour life span for B-47 aircraft. Plans were initiated to obtain and modify two KC-135s as replacement aircraft. These plans came to fruition near the end of 1977.

On October 1, 1977, Major General H.E. Harris, SAC Chief of staff, and Rob Tuttle, an MDC-Tulsa B-47 IP, flew # 52412, now known as 24120, call sign Nucar 4, from MDC-Tulsa to Dyess AFB, Texas. This aircraft was beautifully restored to U.S. Air Force markings and is currently on display at Dyess.

On December 20, 1977, # 52410, now known as 24100, a call sign Nucar 3, was flown from MDC-Tulsa to Pease AFB, New Hampshire. This was to be the last flight of an operational B-47. The flight crew consisted of: Aircraft Commander, Dave Hall, Manager Special Flight Programs, MDC-Tulsa; Copilot, Rob Tuttle, Deputy Manager Special Flight Programs; and Nav/EWO, Travis Blount, Chief Nav/EWO, Special Flight Programs. This aircraft was later restored to Air Force markings and was on display at Pease until Pease closed in 1990. It was then dismantled and shipped to Ellsworth AFB, South Dakota. Parts of 52410 are being used in the restoration of an RB-47H currently undergoing restoration at the USAF Museum in Dayton.

Prior to departing for Pease, all non-essential for flight equipment, which could still be used in the Navy NKC-135 operations, was removed from Nucar 3. Also, an advance team dispatched to Pease to meet the aircraft and assist in removing other equipment for return to Tulsa. The plan was to fly two or three low approaches over Pease upon arrival to provide Pease personnel, many of whom had prior experience working on and/or flying B-47s, a final glimpse of this magnificent bird in flight. Unfortunately, this could not be done because of a snowstorm in progress at arrival time.

This final flight of an operational B-47 was and is considered by me to be an historical event. The Navy and MDC-Tulsa personnel, in a position to know at the time, decided this event would take place with little or no publicity, and so it did.

The B-47 could be mighty unforgiving at times, especially during take-off and landing, but if treated with due respect, she would provide as smooth a ride as one could ever hope for. She was ahead of her time in many ways and performed admirably for many long years. I would be remiss if I did not admit that I was quite happy to climb down the ladder for the last time after having flown over 4800 hours in the old war-horse. I must say, however, that the good memories far exceed the bad.

Let us all hope that the many versions of the B-47 on display across the country are suitably preserved and maintained to provide future generations a look at one of histories most remarkable aircraft.

One More Time

By Walter House, Boeing Service News Staff

Back in 1979, the folks at the Pueblo (Colorado) Air Museum learned of a sole surviving B-47 at the Military Aircraft Storage and Disposition Center (MASDC) located at Davis Monthan AFB, AZ. The B-47E 532104 was actually one of three in storage at the facility and the only one that could be easily transported to Pueblo by flying. The others, B-47E 515251 and RB-47H 534303 were in various stages of disassembly and had been extensively cannibalized.

After acquiring 2104 from the Air Force, the Pueblo Air Museum contracted a local Tucson aviation firm to restore the Stratojet to flying condition. Like the two "E" models flown to Dyess and Pease in 1977, 532104 had spent her last days as a Navy test vehicle, but in contrast she had been in storage and not flown for five years. After the expenditure of only 500 man-hours, the B-47 was ready to go. Her systems had been de-pickled and operationally checked including jacking and landing gear retraction tests. The engines were run and checked for performance and three of the six started on the very first try.

Desert Air Parts, Inc., who had not only been contracted to restore the airplane but also to deliver it to Pueblo, was in need of a flight crew. The search for a pilot was short as a phone call to retired Air Force Colonel George Nakis, a 5,000 hour B-47 veteran, produced results. Though Colonel Nakis had not held a B-47 yoke for thirteen years, he immediately accepted. "There was absolutely no hesitation," Colonel Nakis said. "I wanted to make this last flight. I considered it an honor and it never occurred to me to turn it down."

For a copilot, he turned to Lt. Colonel Bob Fawver, also retired Air Force and holder of 2,000 flying hours in the B-47.

In a mood reminiscent of "The Over-The-Hill Gang rides again," the two pilots dusted off B-47 technical data, checklists, and memories of a crash course in qualification.

"There was no one around qualified to give us a check ride," Colonel Fawver said. "We sort of became our own check pilots."

"It all came back," Colonel Nakis, pointed out, "when I sat in this birds cockpit for the first time. I pulled out my checklist and started going down it, looking for switches, knobs, and gauges. I was surprised how quickly it all came back to me."

The Stratojet no longer belonged to the Air Force and would now make her last flight as a civilian. The FAA certified the plane for a one-time flight and assigned a federal registration number of N1045Y. The national insignia and Air Force tail number were covered with a coat of black paint. The only remaining trace of Air Force identity was the partial strip of SAC banner on the nose that somehow survived.

On 12 July, 1979, 2104 was taxied from the MASDC compound onto the D-M flight line, moving under her own power for the first time in 5 years. As she moved along the taxiway, activity on the flight line came to a halt. Some of the younger troops expressed question while a few smiles were produced by the older maintenance heads as they recognized the familiar groaning from the application of the expander tube brakes.

Activity around the B-47 the next morning indicated that this was the day. Nakis and Fawver made their walk around and with one final look, climbed the entrance ladder. In accordance with the checklist, number four engine was started first followed by the other five in sequence. After an uneventful taxi, the takeoff roll was started. At 4,600 feet down the runway and 123 knots she was once again airborne. "She performed perfectly on takeoff," Colonel Nakis said. "No problems whatsoever. We grossed 117,000 pounds and the acceleration was exactly as advertised."

The flight to Pueblo was made at 15,000 feet and 400 knots and took an hour and forty minutes. They landed at 94,000 pounds gross weight and stopped in 5,800 feet. The city and museum officials were there to greet the delivery crew and the airplane was turned over to them.

So, twenty-six years and four months after being delivered to the Air Force, 532104 was saved from the smelter and given a permanent home at the Pueblo Air Museum.

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"Spirit," The Last Flight of a B-47

By Major General J. D. Moore, USAF (Ret)

The last flight of a B-47 occurred on 17 June 1986. The Castle AFB Museum personnel found B-47, tail number 520166, in the desert at China Lake Naval Test Center, California about four years earlier. Castle Museum and China Lake personnel, all volunteers, spent 36,000 hours rebuilding and making the bird look like it just left the Boeing plant and in a flyable condition. The aircraft was dubbed the "SPIRIT" for the hundreds of men and women that brought it back to life after twenty-two years sitting in the California's Mojave Desert. The plan was to fly it 300 miles to Castle to be placed in the Castle Air Museum.

The aircraft, one of 2042 manufactured during the Cold War, was delivered to the Air Force on 25th of October 1954. Its assignment history was first assigned to the 9th BW Mountain Home AFB, Idaho Later assignments were with the 509th at Walker AFB and Pease AFB. Its last base was at Forbes AFB where it was dropped from the USAF inventory in August 1964 and assigned to the Navy at China Lake. The Navy parked the aircraft twenty-three miles in the desert and used it as a practice radar target for their weapons testing and scoring. It cannot be over emphasized that after twenty-three years, the restoration process was a gigantic task accomplished by many dedicated individuals of both the Air Force and the Navy. My role as the aircraft commander was a small part of making this dream a reality.

I became involved with the project during a meeting at SAC headquarters when General Benny Davis, the Commander of SAC at that time, asked his senior staff if anyone had any B-47 flying time. The meeting went silent. Knowing that I had once flown the B-47, General Davis turned too me and said, "I'm to busy, so you have the project." Later, I received a folder with all of the specifics of the restoration and the plan to get the aircraft to Castle. Over the next couple of years, I followed the progress of the volunteers as they prepared the aircraft for its last flight. There were numerous delays in the project as Air Force officials and B-47 supporters assured themselves that the aircraft was safe to fly. One item that was of major concern was the insurance that would be required since the Castle Museum owned the aircraft and not the Air Force. Even Lloyds of London wanted several million to insure the flight. The final decision, made by SAC, was to bring the aircraft back into the USAF aircraft inventory and assign it to Castle for the one time flight. This put the Commander at Castle on the hot seat. We received wonderful support during those final days before the flight.

This brings us to June 1986. After years of preparation and hard work by many people, the aircraft, weather and the Air Force had a new aircraft assigned to Castle. The crew was made up of Lt. Colonel Dale Wolfe, an FB-111A pilot who

had previously flown as a copilot on B-47s and myself. The Crew Chief, CMSGT Lindsey, said the aircraft was ready and completely checked out. In preparation for the flight we completed a high-speed taxi test at China Lake followed by another complete aircraft inspection with very satisfactory results. Lt. Colonel Wolfe and I reviewed the systems that were operational. Only the systems required for flight were restored and two T-33s from Castle ADC Squadron were brought in to fly chase and act as our eyes and ears to help us get to Castle. As it turned out they were invaluable and did a very professional job.

The morning of the 17th of June arrived and Dale and I were ready to crank the old bird up and jump across the mountain to Castle. The aircraft was preflighted and the two chase aircraft were ready. Flight plans were filed and Los Angeles and San Francisco Centers were briefed on what was going to happen and we were ready. The first glitch was in locking the canopy. The pins that backup the cam locks wouldn't slide into place. A planned 09:00 takeoff was passing as Chief Lindsey fixed the slides with a trusty hammer and maul. Things never change. If at first it doesn't fix it, get a larger hammer. Activity started to progress with six of those beautiful engines coming alive and the wonderful group of dedicated people lined up on the ramp giving us their best wishes. Taxing went well and China Lake closed the field for our takeoff with a planned circle of the field to assure all was well. The two T-33's took off first and were in position to pick us up as we lifted off. The take off went well to about 105 knots when the airspeed went to zero. We were to far down the runway to stop, as we were airborne at about the same instant. The aircraft was very light since most of the onboard bombing systems were not installed and we only had 35,000 pounds of fuel for the one-hour flight. Since I didn't have any airspeed I started to lower the nose slightly to assure a good airspeed for the initial climb, and to my amazement you could push the yoke to the instrument panel with no actual down elevator movement. The manual trim solved this problem and all the rest of the flight controls operated normally. The Chase pilots were with us and helped giving us airspeeds as we brought our flaps up without any problems. The only good decision I made all day was to leave the gear down to assure a gear if we had to return immediately. We made on complete circle around China Lake and with the help of the chase pilots to help navigate since we were short a few instruments we finally started out for Castle. A climb to 18,000 feet was made. Hot seats and oxygen were the only creature comforts on board and we proceeded across the Sierra Mountains on a direct course. We cruised at 280 kts. with gear down.

As we approached Fresno, we decided to start a letdown to arrive at Castle for a runway pass followed by a landing. With down elevator trim and power at idle we started down. In no time the chase said we were approaching 300 kts. and we looked high. I forgot how slick that aircraft was even with the gear down. I started

an S-turn to the right with about forty-five degrees of bank to loose altitude. About half way in the turn I started to reverse and you guessed it, the ailerons were locked solid in a right turn. About that time the right aileron power light came on and as I turned off the right power control the aileron lock-up broke loose and we again had ailerons. The left aileron power control remained normal. We continued and noticed hundreds of cars and people on side roads around Castle. The base was open to normal military operations. We flew across the field at about a thousand feet and turned downwind. Since we planned to deploy the approach chute to allow better engine control, I heard later that many maintenance and other people on the flight line thought we put out the brake chute in-flight since the B-52s at Castle do not have an approach chute. Since we had a few problems we decided to fly a little longer final approach to give us a little more time to manually trim and control the aircraft. About 500 feet on final the tower gave us a new wind, which agreed with the crab I was experiencing. Yes, the winds picked up and were about fifty degrees off runway heading. With a good rudder and one aileron power control, it would be interesting but still OK to straighten out the nose and drop the left wing for landing. Yes, you guessed it again, at 100 feet when I was giving it right rudder and left aileron to assure that the bicycle gear would touch down aligned with the runway, the left aileron power control gave up and the left wing came up, the backup manual control was so sloppy I had to give it left rudder to get the left wing back down. There we sat punching rudders with a swept wing aircraft causing dutch role and the nose coming up. The last fifty feet were indeed exciting and we didn't land, we arrived and stayed on the gear. Thank goodness Castle had a 300-foot wide runway, which we had to use all of to stay on the runway.

We taxied in to a wonderful crowd and were greeted by the wing Commander. Needless to say, he was sweating bullets and I believe he was happier than I was for safely getting this beautiful bird to Castle. We arrived with only a small scrape on the number six bottom cowl, which was easily repaired, but you can visualize the wing wallow and dutch roll we had at touchdown. Thank goodness for a great and powerful rudder and a manual down elevator trim. Yes, the Wing Commander also appreciated he didn't have an accident investigation on his record. I'm not sure which he appreciated most.

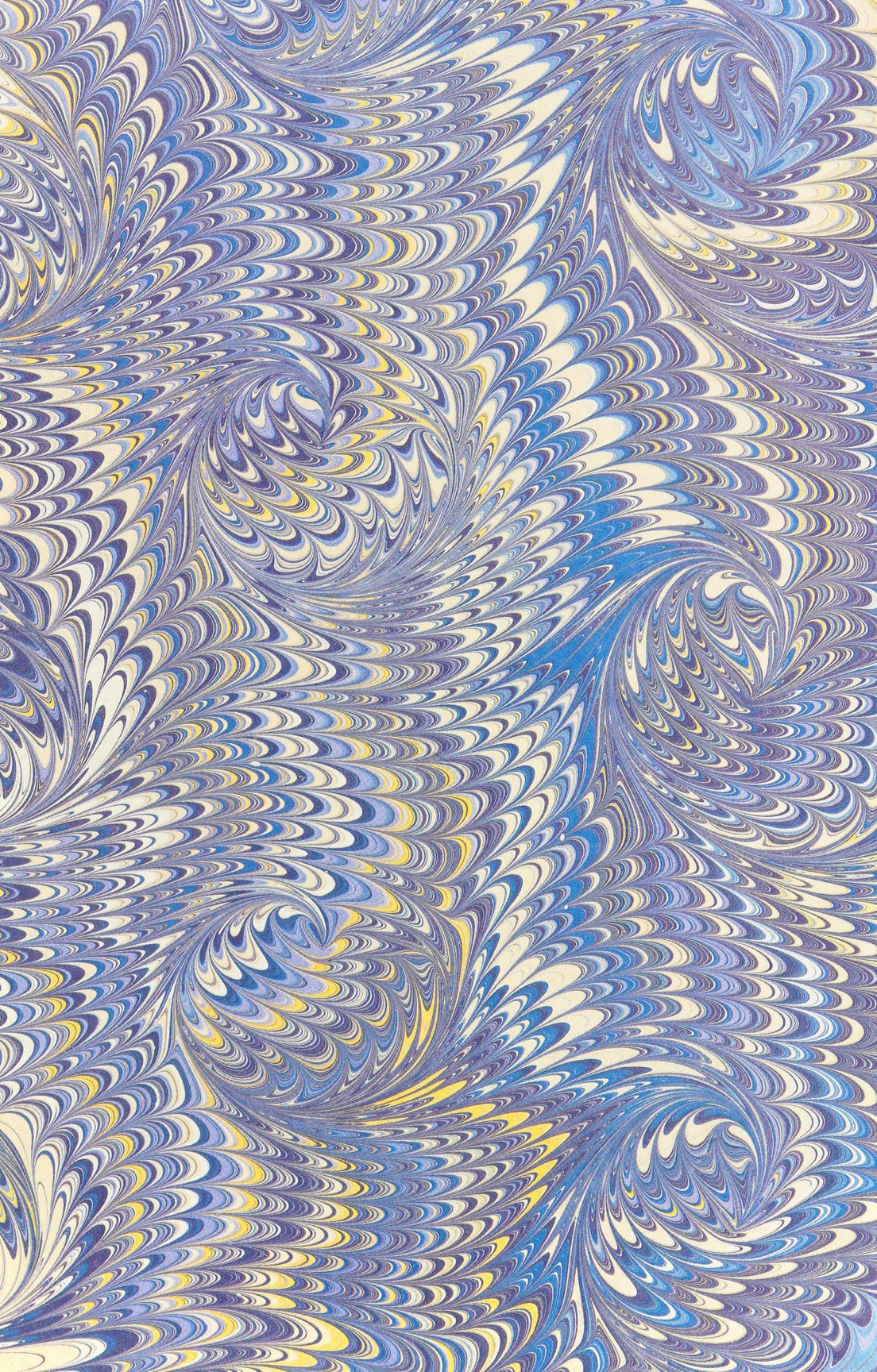
The museum at Castle is one of the finest and with the addition of the B-47, it can say it received the last flown B-47 on 17 June 1986. Dale Wolfe and I will never forget this flight. Without Dale's help and support there could have been a completely different outcome.

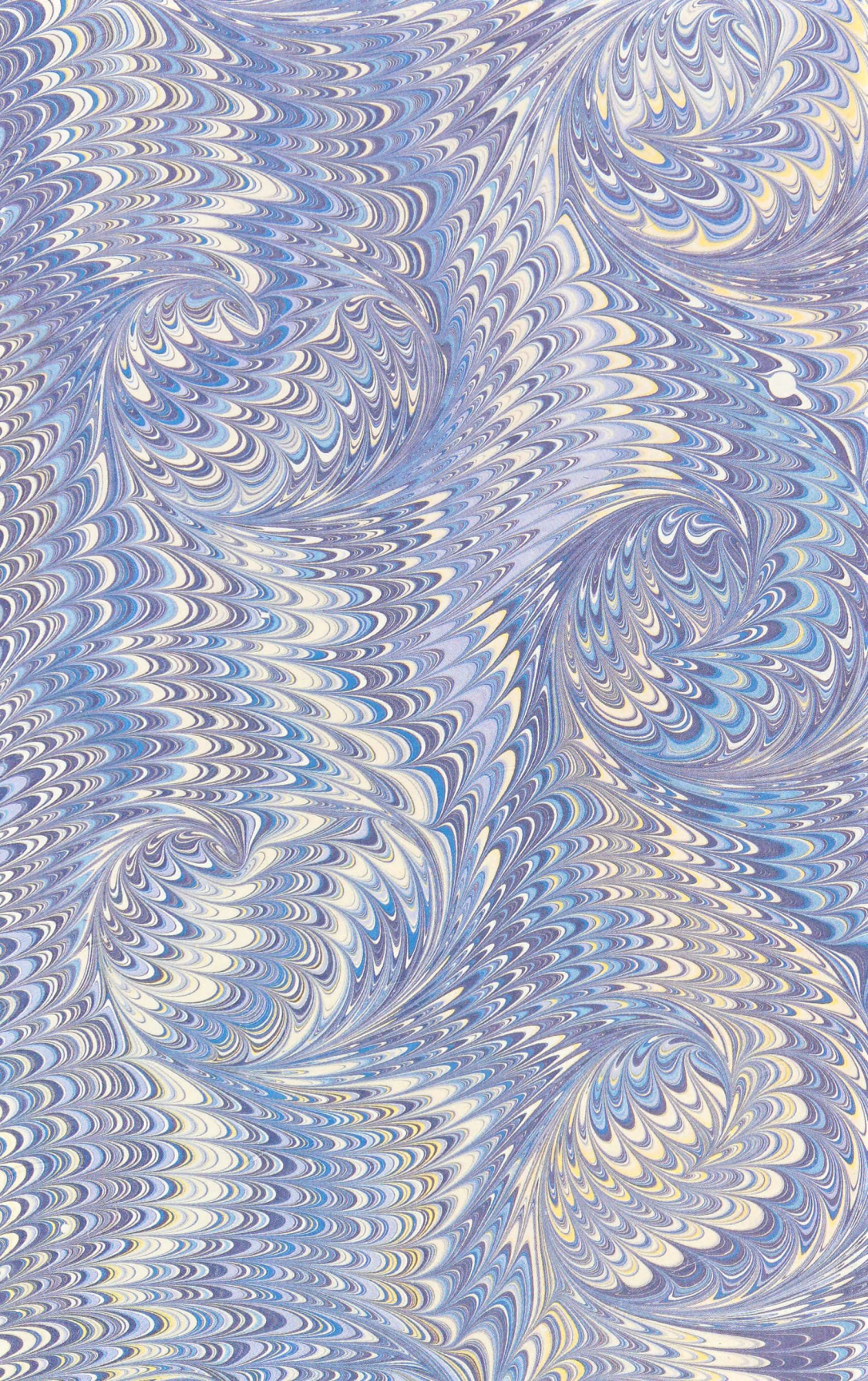
This was the end of four years of hard work by military and civilian volunteers in returning the great B-47 to its place in history. Support your Military Museums and history of the United States Air Force. The Museums need all the help we can give them to assure their longevity!

Glossary

AC	Aircraft Commander
AFB	Air Force Base
AGL	Above Ground Level
AMC	Air Materiel Command
AOB	Aircraft Observer Baombardier
APGC	Air Proving Ground Command
ARCP	Air Refueling Point
ATF	Actual Time of Fall
ATO	Assisted Take-Off
AWS	Air Weather Service
BFS	Best Flare Speed
BN	Bombardier-Navigator
BRL	Bomb Release Line
BS	Bomb Squadron
BW	Bomb Wing
CAT	Clear Air Turbulence
CAVU	Clear and Visibility Unlimited
CCTS	Combat Crew Training Squadron
CCTW	Combat Crew Training Wing
CINCSAC	Commander in Chief Strategic Air Command
CG	Center of Gravity
DEW	Distant Early Warning Line
DFC	Distinguished Flying Cross
DR	Dead Reckoning
ECM	Electronic Countermeasures
EGT	Exhaust Gas Temperature
ELINT	Electronics Intelligence
EWO	Electronic Warfare Officer
FTD	Field Training Detachment
GCA	Ground Control Approach
IAS	Indicated Air Speed
IBDA	Initial Bomb Damage Assessment

ILS	Instrument Landing System
IP	Initial Point
IP	Instructor Pilot
IR	Infra Red
JATO	Jet Assisted Take-Off
JN	Jet Navigation
KIAS	Knots Indicated Air Speed
LABS	Low Altitude Bombing System
MATS	Military Air Transport Service
MITO	Minimum Interval Take-Off
NACA	National Advisory Committee for Aeronautics
NORAD	North American Air Defense
OMS	Organizational Maintenance Squadron
OSV	Ocean Station Vessel
PDI	Pilot Data Indicator
PDM	Periodic Depot Maintenance
PP	Pilot Proficiency
RAF	Royal Air Force
Raven	Electronic Countermeasures Officer
RBS	Radar Bomb Scoring
RN	Radar Navigator
RPM	Revolutions Per Minute
SAC	Strategic Air Command
SRS	Strategic Reconnaissance Squadron
SRW	Strategic Reconnaissance Wing
StandBoard	Standardization Board
TCTO	Time Compliance Tech Order
TDY	Temporary Duty
UK	United Kingdom
USCM	Unit Simulated Combat Mission
VOQ	Visiting Officers Quarters
WADC	Wright Air Development Center
WPABF	Wright-Patterson Air Force Base
WRS	Weather Reconnaissance Squadron





Above: Two NB-47E's (formerly EB-47E's) flown by the United States Navy. Front cover top: XB-47 #1 at Moses Lake. Front cover bottom: B-47E of the 40th BW in flight.

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